Sciortino Ranch Project

SCH# 2008112041

Draft Environmental Impact Report

Prepared For
the City of Brentwood

February 2009

Prepared By

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1. INTRODUCTION

1 INTRODUCTION

Introduction

The Sciortino Ranch Draft Environmental Impact Report (Draft EIR) has been prepared in accordance with the California Environmental Quality Act of 1970, Pub. Res. Code §§ 21000-21178, as amended (CEQA) and the Guidelines for Implementation of the California Environmental Quality Act, Cal. Code Regs. title 14, §§ 15000-15387 (CEQA Guidelines). The City of Brentwood is the lead agency for the environmental review of the Sciortino Ranch project (proposed project) evaluated herein and has the principal responsibility for approving the project. As required by Section 15121 of the CEQA Guidelines, this EIR will (a) inform public agency decision-makers, and the public generally, of the significant environmental effects of the project, (b) identify possible ways to minimize the significant adverse environmental effects, and (c) describe reasonable and feasible project alternatives which reduce environmental effects. The public agency shall consider the information in the Draft EIR along with other information that may be presented to the agency.

Project Description

The proposed project site is within the North Brentwood Redevelopment Area, Special Planning Area (SPA) A, and also within the limits of the proposed Brentwood Boulevard Specific Plan (BBSP) area, for which a draft specific plan policy document has been prepared and is currently being finalized by the City. The project site is located at the intersection of Sand Creek Road and Brentwood Boulevard (State Route 4) and is approximately 65 acres. The project site consists of two legal parcels, identified by Assessor's Parcel Numbers (APNs) 016-170-012 and -013. The proposed project site is surrounded by residential development to the north, east and south with commercial to the west.

The project site primarily consists of vacant land. However, a natural gas well exists in the northeastern portion of the site. In addition, evidence of a former agricultural residence – associated buildings and an inactive water well – is located near the western boundary of the site. The site has been disked, and was historically used for agriculture.

Proposed Project

The proposed project includes General Plan and PD zone amendments that would permit park, multi-family residential and single-family residential, retail, office, commercial, and/or institutional uses on the project site. The applicant has provided three probable scenarios for a potential mix of land uses that could occur on the proposed project site. For the purposes of this analysis, the EIR will use a conservative approach and assume the most intense level of development. It should be noted that the other two scenarios will be assessed in the Alternatives chapter of the EIR.

The project site's existing General Plan land use designations include Mixed-Use Business Park and Very High Density Residential; therefore, the proposed project would require a General Plan Amendment. The relevant General Plan text would be modified to reflect the proposed amendment to the Special Planning Area (SPA-A) description. The General Plan Land Use Map would also be amended to reflect the SPA-A land use designation. The PD-55 Zone would be modified to be consistent with new proposed design guidelines and 11 new zoning sub-areas. In addition, the project would include a Vesting Tentative Subdivision Map that subdivides two parcels (APNs 016-170-012 and -013) into 11 new parcels, consistent with the proposed PD-55 sub-zone areas. Future development of the site would include the previously planned extension of Sand Creek Road, which would traverse the site from east to west. For a more detailed project description, please refer to Chapter 3, Project Description, of this Draft EIR.

Purpose of the EIR

As provided in the CEQA Guidelines Section 15021, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. The public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social issues.

CEQA requires the preparation of an EIR prior to approving any project that may have a significant effect on the environment. For the purposes of CEQA, the term *project* refers to the whole of an action that has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]). With respect to the proposed project, the City has determined that the proposed development is a *project* that has the potential for resulting in significant environmental effects within the definition of CEQA.

The EIR is an informational document that apprises decision makers and the general public of the potential significant environmental effects of a proposed project. An EIR must describe a reasonable range of feasible alternatives to the project and identify possible means to minimize the significant effects. The lead agency, which is the City of Brentwood for this project, is required to consider the information in the EIR along with any other available information in deciding whether to approve or deny the application. The basic requirements for an EIR include discussions of the environmental setting, environmental impacts, mitigation measures, alternatives, growth inducing impacts, and cumulative impacts.

EIR Process

The EIR process begins with the decision by the lead agency to prepare an EIR, either during a preliminary review of a project or at the conclusion of an Initial Study. Once the decision is made to prepare an EIR, the lead agency sends a Notice of Preparation (NOP) to appropriate government agencies and, when required, to the State Clearinghouse (SCH) in the Office of Planning and Research (OPR), which will ensure that responsible State agencies reply within the required time. The SCH assigns an identification number to the project, which then becomes the identification number for all subsequent environmental documents on the project. Applicable agencies have 30 days to respond to the NOP, indicating, at a minimum, reasonable alternatives and mitigation measures they wish to have explored in the Draft EIR and whether the agency

will be a responsible agency or a trustee agency for the project. An NOP (See Appendix A) was prepared for the Sciortino Ranch project and was circulated from November 10, 2008 to December 9, 2008. A public scoping meeting was held on November 21, 2008 for the purpose of informing the public of a proposed project being developed in the City of Brentwood.

As soon as the Draft EIR is completed, a notice of completion is filed with the SCH and a public notice is published to inform interested parties that a Draft EIR is available for agency and/or public review. In addition, the notice provides information regarding the location of drafts and any public meetings or hearings that are scheduled. The Draft EIR is circulated for a period of 45 days, during which time reviewers may make comments. The lead agency must evaluate and respond to comments in writing, describing the disposition of any significant environmental issues raised and explaining in detail the reasons for not accepting any specific comments concerning major environmental issues. If comments received after public notice is given result in the addition of significant new information to an EIR, the revised EIR or affected chapters must be recirculated for an additional public review period with related comments and responses.

Once the lead agency is satisfied that the EIR has adequately addressed the pertinent issues in compliance with CEQA, a Final EIR will be prepared. The Final EIR is made available for review by the public or commenting agencies. Before approving a project, the lead agency shall certify that the Final EIR has been completed in compliance with CEQA, and that the Final EIR has been presented to the decision-making body of the lead agency, which has reviewed and considered the EIR. The lead agency shall also certify that the Final EIR reflects the lead agency's independent judgment and analysis.

The findings of fact prepared by the lead agency must be based on substantial evidence in the administrative record and must include an explanation that bridges the gap between evidence in the record and the conclusions required by CEQA.

Based on these findings, the lead agency may also prepare a Statement of Overriding Considerations (Statement) as part of the project approval process. If the decision-making body elects to proceed with a project that would have unavoidable significant impacts, then a Statement explaining the decision to balance the benefits of the project against unavoidable environmental impacts must be prepared.

Scope of the Draft EIR

State CEQA Guidelines § 15126.2(a) states, in pertinent part:

> An EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced.

Pursuant to these guidelines, the scope of this Draft EIR addresses specific issues and concerns identified as potentially significant. These were determined based on the preparation of an Initial Study, review of comments received on the NOP, and review of testimony received at the

scoping meeting. The Initial Study prepared for the proposed project concluded that several environmental issues would result in a less-than-significant impact. The complete text of the Initial Study is contained in Appendix C.

Resources identified for study in this Draft EIR include:

- Land Use;
- Aesthetics;
- Transportation and Circulation;
- Air Quality and Climate Change;
- Noise;
- Biological Resources;
- Cultural Resources;
- Hazards; and
- Public Services and Utilities.

The evaluation of effects is presented on a resource-by-resource basis in Chapters 4.1 through 4.9 of the Draft EIR. Each technical chapter is divided into four sections: Introduction, Environmental Setting, Regulatory Context, and Impacts and Mitigation Measures.

Impacts that are determined to be significant in Chapter 4, and for which feasible mitigation measures are not available to reduce those impacts to a less-than-significant level, are identified as *significant and unavoidable*. Chapter 5 of the Draft EIR presents a discussion and comprehensive list of all significant and unavoidable impacts identified in Chapter 4.

Comments Received on the Notice of Preparation

The City of Brentwood received four comment letters (See Appendix B) during the open comment period on the Notice of Preparation for the Sciortino Ranch project. The letters were authored by the following representatives of State and local agencies, as well as other interested parties:

- Carboni, Lisa – Department of Transportation
- Roggenkamp, Jean – Bay Area Air Quality Management District
- Stamps, Jamar – Department of Conservation and Development, Contra Costa County
- Stites, Moses – Public Utilities Commission

In addition, a verbal comment from the following party was received during the NOP scoping meeting held on November 21, 2008:

- Tittle, Barbara – Brentwood Union School District

The following list, categorized by issue, summarizes the concerns in these letters and presents where in the document the concerns are addressed:

Transportation and Circulation (*c.f.* Chapter 4.3)	Concerns related to: • Project-related trip generation, distribution, and assignment. • Average daily traffic, AM and PM peak hour volumes, and levels of service (LOS) on all affected roadways. • Project access in relation to nearby State roadways, existing and future. • Traffic conditions for existing, existing plus project, and cumulative intersections in the project area. • Mitigation for highway and non-highway improvements and services with alternate circulation solutions. • Planned transit access and pedestrian and bicycle connectivity. • Work within a State right-of-way. • Impacts to the Union Pacific Railroad (UPRR) main line rail corridor, rail service, and rail corridor right-of way. • At-grade rail crossings. • Analysis of rail safety impacts.
Air Quality and Climate Change (*c.f.* Chapter 4.4)	Concerns related to: • Criteria for all pollutants and implications for the region. • Inclusion of $PM_{2.5}$ and ozone updated standards. • Local and regional air quality effects due to construction and operation, as well as cumulative impacts. • Estimation of emissions for both existing and proposed land uses. • Significance thresholds for volatile organic compounds (VOCs), nitrogen oxides (NO_X), and particulate matter (PM_{10}) emissions. • Evaluation of potential health risks to current and future sensitive population within the project area. • Potential exhaust emissions associated with State Route 4 and the nearby rail line for sensitive receptors. • Impacts related to nearby gas well. • Mitigation for diesel particulate matter and exhaust emissions produced by construction equipment. • Evaluation of energy demands for project buildout. • Discussion of green building measures for new development. • Discussion of greenhouse gases.
Cultural Resources (*c.f.* Chapter 4.7)	Concerns related to: • Documentation for a current archaeological records search.

All of these issues are addressed in this Draft EIR, in the relevant chapters identified in the first column.

Organization of the Draft EIR

The Sciortino Ranch Draft EIR is organized into the following chapters:

Chapter 1 – Introduction
Provides an introduction and overview describing the intended use of the Draft EIR and the review and certification process, as well as summaries of the chapters included in the Draft EIR and summaries of the issues and concerns received from the public and public agencies during the NOP review period.

Chapter 2 – Executive Summary
Summarizes the elements of the project and the environmental impacts that would result from implementation of the proposed project, describes proposed mitigation measures, and indicates the level of significance of impacts after mitigation. Acknowledges alternatives that would reduce or avoid significant impacts.

Chapter 3 – Project Description
Provides a detailed description of the proposed project, including the project's location, background information, major objectives, and technical characteristics.

Chapter 4 – Existing Environmental Setting, Impacts, and Mitigation
Contains a program-level and cumulative analysis of environmental issue areas associated with the proposed project. Each environmental issue chapter contains an introduction and description of the project setting, identifies impacts, and recommends appropriate mitigation measures, if needed.

Chapter 5 – Statutorily Required Sections
Provides discussions required by CEQA regarding impacts that would result from the proposed project, including a summary of cumulative impacts, potential growth-inducing impacts, significant and unavoidable impacts, and significant irreversible changes to the environment.

Chapter 6 – Alternatives Analysis
Describes the alternatives to the proposed project, their respective environmental effects, and a determination of the environmentally superior alternative.

Chapter 7 – References
Lists EIR and technical report authors who provided technical assistance in the preparation and review of the Draft EIR.

Chapter 8 – EIR Authors / Persons Consulted
Provides bibliographic information for all references and resources cited.

Appendices
Includes the NOP, comments received during the NOP comment period, the Initial Study, and all technical reports prepared for the proposed project.

2. EXECUTIVE SUMMARY

2 EXECUTIVE SUMMARY

Introduction

The Executive Summary chapter provides an overview of the Sciortino Ranch project (See Chapter 3, Project Description, for a detailed project description) and summarizes the conclusions of the environmental analysis provided in Chapters 4.1 through 4.9. This chapter also reviews the alternatives to the proposed project that are described in Chapter 6, Alternatives Analysis, and identifies the Environmentally Superior Alternative. Table 2-1, found at the end of this chapter, provides a summary of the environmental effects of the proposed project, which are identified in each technical chapter of this Draft EIR. Table 2-1 contains the potential environmental impacts associated with the proposed project, the significance of the impacts, the proposed mitigation measures for the impacts, and the significance of the impacts after implementation of the mitigation measures.

Project Location and Description

The proposed Sciortino Ranch project is located within the northeastern portion of the City of Brentwood. The City of Brentwood is located in the eastern valley area of Contra Costa County immediately east of the Diablo Range, on the western edge of the San Joaquin Valley.

The project site's existing General Plan land use designations include Mixed-Use Business Park and Very High Density Residential; therefore, the proposed project would require a General Plan Amendment. The relevant General Plan text would be modified to reflect the proposed amendment to the Special Planning Area (SPA-A) description. The General Plan Land Use Map would also be amended to reflect the SPA-A land use designation. The PD-55 Zone would be modified to be consistent with new proposed design guidelines and 11 new zoning sub-areas. In addition, the project would include a Vesting Tentative Subdivision Map that subdivides two parcels (APNs 016-170-012 and -013) into 11 new parcels, consistent with the proposed PD-55 sub-zone areas. Future development of the site would include the previously planned extension of Sand Creek Road, which would traverse the site from east to west. For a more detailed project description, please refer to Chapter 3, Project Description, of this Draft EIR.

Environmental Impacts and Mitigation

Under the California Environmental Quality Act (CEQA), a significant effect on the environment is defined as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, mineral, flora, fauna, ambient noise, and objects of historic or aesthetic significance. Implementation of the proposed project could result in significant impacts on the resource areas listed below.

This Draft EIR discusses mitigation measures that could be implemented by the City to reduce potential adverse impacts to a less-than-significant level. Such mitigation measures are noted in this Draft EIR and are found in the Land Use, Aesthetics, Transportation and Circulation, Air Quality and Climate Change, Noise, Biological Resources, Cultural Resources, Hazards, and Public Services and Utilities chapters. If an impact is determined to be significant or potentially significant, applicable mitigation measures are identified, as appropriate. These mitigation measures are also summarized in Table 2-1, below. The mitigation measures presented in the Draft EIR will form the basis of the Mitigation Monitoring Plan. An impact that remains significant after implementation of mitigation measures is considered a significant and unavoidable impact.

Land Use

The Land Use chapter evaluates the consistency of the proposed project with the City of Brentwood's adopted plans and policies. The evaluation is based on a review of the City's General Plan and Zoning Ordinance, as well as any other appropriate documents, to address consistency issues.

The Land Use chapter concludes that impacts related to the following issues would be less-than-significant: consistency with adopted General Plan designations and policies; consistency with existing zoning; and the cumulative increase in the intensity of land uses in the region due to the proposed project and all other projects in the Brentwood area. A potentially significant impact is identified regarding the proposed project's compatibility with existing or planned surrounding land uses. However, the impact would be reduced to a less-than-significant impact with the implementation of the mitigation measure identified in the chapter.

Aesthetics

The Aesthetics chapter of the EIR summarizes existing regional and project area aesthetics, including a description of the existing visual character and quality of the site. In addition, the Aesthetics chapter describes any scenic vistas, scenic highways, or scenic resources, such as trees and/or historic resources that exist on the project site. Creation of new sources of light and glare by the project and the effects upon the surrounding vicinity are also evaluated in the Aesthetics chapter.

The Aesthetics chapter concludes that impacts related to the following issues would be less-than-significant: impacts to scenic vistas and natural resources, including resources found within State scenic highway corridors; impacts related to the existing visual character or quality of the site and surroundings; impacts related to the generation of light and glare; and cumulative long-term impacts to the visual character of the region from the proposed project in combination with existing and future developments in the Brentwood area.

Transportation and Circulation

The Transportation and Circulation chapter of the Draft EIR is based on a traffic study prepared for the Sciortino Ranch project. The Transportation and Circulation chapter describes existing

traffic conditions, summarizes the existing and planned regional and local transportation network, and describes the traffic load and capacity of street systems, including level of service standards for critical street segments and intersections. The chapter also includes an analysis of the Existing, Existing Plus Approved Projects, Existing Plus Approved Plus Proposed Project, and Cumulative With and Without Project scenarios. Other issues addressed in the Transportation and Circulation chapter include traffic hazards due to design features, emergency access, and transit, bicycle, and pedestrian facilities.

The traffic study determined that impacts to four of the study intersections would be potentially significant with buildout of the proposed project. These impacts would be reduced to a less-than-significant level after implementation of the mitigation measures identified in the chapter. The traffic study determined that impacts to transit, bicycle, and pedestrian facilities would be less-than-significant. Cumulative impacts to study intersections to transportation and circulation would be potentially significant, but would be reduced to a less-than-significant level after implementation of the mitigation measures identified in the chapter.

Air Quality and Climate Change

The Air Quality chapter summarizes the regional air quality setting, including climate and topography, ambient air quality, and regulatory setting. For the Air Quality chapter, the URBEMIS-2007 program was utilized to evaluate anticipated airborne pollutant emissions from the Sciortino Ranch project from direct sources (project vehicle emissions). The calculated emissions were compared to the thresholds of significance recommended by the Bay Area Air Quality Management District (BAAQMD). The Air Quality chapter also addresses impacts associated with project construction activities, as well as cumulative air quality impacts associated with the project.

The Air Quality and Climate Change chapter concluded that air quality impacts to residences located next to Brentwood Boulevard would be less-than-significant. The Air Quality chapter determined that short-term impacts related to construction would be considered potentially significant. This impact would be reduced to a less-than-significant level with implementation of the mitigation measures found in the chapter. In addition, a significant impact would result from regional air quality due to project trip generation, even after mitigation the impact would be significant and unavoidable. The chapter concludes with a global climate change analysis wherein the project's contribution to greenhouse gases is discussed and recommendations are provided for the project in order to reduce the project's contribution to greenhouse gas (GHG) emissions, consistent with the strategies identified to date by involved regulatory agencies. It should be noted that all of the mitigation measures included in the Air Quality chapter would reduce GHG emissions, to some extent.

Noise

The Noise chapter is based on an environmental noise assessment performed by j.c. brennan & associates, Inc. The chapter includes an analysis of the existing setting and identification of thresholds of significance, project-related impacts, and mitigation measures. The Noise chapter

evaluates potential project noise impacts associated with traffic activities, construction activities, and commercial operational impacts.

The Noise chapter concluded that impacts related to the following issues would be less-than-significant: traffic noise level increases at existing land uses in the project area and impacts related to construction vibration. The following impacts are identified as potentially significant prior to mitigation: impact of traffic noise at future noise-sensitive land uses developed on the project site; impacts related to excessive interior noise levels at future noise-sensitive receptors within the project site; impacts of commercial noise sources on existing and future noise-sensitive uses in the project area; impacts of neighborhood parks on future noise-sensitive uses within the project area; and impacts related to construction noise. In addition, cumulative impacts as a result of project-related traffic on existing noise-sensitive uses adjacent to the project site were determined to be potentially significant, but would be reduced to a less-than-significant level with implementation of the mitigation measures found in the chapter.

Biological Resources

The Biological Resources chapter is based on an assessment prepared by Mosaic Associates LLC and includes a description of the potential effects on plant communities, wildlife, and wetlands, including adverse effects on rare, endangered, candidate, sensitive, and special-status species that were identified during site reconnaissance. In addition, the chapter assigns mitigation measures, if feasible, to limit the impacts to a less-than-significant level. The Biological Resources chapter also identifies the required permits relating to biological resources.

The Biological Resources chapter concluded that impacts related to the following issues would be less-than-significant: impacts related to interference with the movement of native wildlife; impacts to jurisdictional Waters of the United States and Waters of the State; and impacts related to a conflict with local policies. The following impacts are identified as potentially significant prior to mitigation: impacts to special-status plants; impacts to burrowing owl; impacts to Swainson's hawk; impacts to raptors and migratory birds; impacts to existing trees; and contribution to cumulative impacts to biological resources. However, implementation of the mitigation measures included in the chapter, as well as applicable goals and policies in the HCP/NCCP, would reduce the impacts to a less-than-significant level.

Cultural Resources

The Cultural Resources chapter describes cultural resources known to be located on the project site. Prehistoric resources are sites and artifacts associated with indigenous, non-Euroamerican populations, generally prior to contact with people of European descent. Historical resources include structures, features, artifacts, and sites that date from Euroamerican settlement of the region. The extent to which development of the proposed project could remove, damage, or destroy existing historic or prehistoric resources is evaluated.

The Cultural Resources chapter concluded that potential impacts to historical structures would be less-than-significant. However, potential impacts to any unknown archeological resources on the site and in conjunction with other development in the City of Brentwood would be potentially

significant requiring mitigation to reduce the impacts to a less-than-significant level. The appropriate mitigation measures are presented in the chapter to reduce all the identified impacts to a less-than-significant level.

Hazards

The Hazards chapter analyzes the existing project setting, describes existing hazardous materials on-site, and determines if the proposed project would exacerbate or create hazardous conditions in the area, or if the proposed project would bring people into contact with hazardous materials or substances. The Hazards chapter identifies any hazardous materials or substances that may be present at the project site or adjacent sites and identifies mitigation measures designed to reduce their impacts. In addition, the Hazards chapter identifies the thresholds of significance and impacts, and specifies mitigation measures for the project.

The Hazards chapter concludes that impacts related to the following issues would be less-than-significant: impacts related to exposure to manmade asbestos and lead-based paint; impacts related to the presence of pesticide and/or herbicide residues on the project site; impacts related to wildland fires; impacts related to operational hazard-related residential, office, and institutional uses; and cumulative impacts identified in the hazards chapter related to the long-term hazard-related impacts from the proposed project in combination with existing and future developments in the Brentwood area. The following impacts are identified as potentially significant prior to mitigation: impacts related to the presence of gas wells on the project site; impacts related to the presence of gas pipelines on the project site; impacts related to transformers and other PG&E utilities; impacts related to soil contamination from the presence of underground storage tanks and agricultural irrigation wells; impacts related to coccidioidomycosis; and impacts related to ground shaking.

Public Services and Utilities

The Public Services and Utilities chapter summarizes existing setting information and identifies potential new demand for services, including wastewater systems, solid waste disposal, law enforcement, fire protection, schools, libraries, parks and recreation, open space, and electric power. In addition, the Public Services and Utilities chapter includes identification of the thresholds of significance, project-related impacts, and mitigation measures.

The Public Services and Utilities chapter concluded that impacts related to the following issues would be less-than-significant: adequate storm drainage facilities for the proposed project; need for additional waste disposal/recycling services; and impacts to telephone and cable service. The following impacts are identified as potentially significant prior to mitigation: adequate water supply and delivery for new residents; adequate wastewater facilities for new residents; adequate ratio of law enforcement personnel to residents; adequate fire protection services available to new residents; number of enrolled students exceeding capacity; adequate provision of parks, recreation, and open space for new residents; and project impacts on the City of Brentwood Library; and impacts to natural gas and electric facilities. These impacts would be reduced to a less-than-significant level after implementation of the mitigation measures identified in the

chapter. Cumulative impacts for the increased demand of additional public services and utilities as a result of the proposed project would be less-than-significant.

As stated in Chapter 1, Introduction, the Initial Study prepared for the proposed project concluded that the environmental issues addressed in the Draft EIR would be those that would result in potentially significant impacts. The remaining environmental issues were addressed and dismissed in the Initial Study, which is included as Appendix C.

Summary of Project Alternatives

The following summary provides brief descriptions of the three alternatives to the proposed project that are evaluated in this Draft EIR. For a more thorough discussion of project alternatives, please refer to Chapter 6, Alternatives Analysis.

No Project Alternative

CEQA requires the evaluation of the comparative impacts of the "No Project" alternative (CEQA Guidelines Section 15126.6 [e]). The No Project Alternative is defined in this instance as "no action taken on the proposed project" or "no build" on the project site. A No Project alternative in this case means that the site would remain in its current state; therefore, the development activity associated with the proposed project would not occur. A "no action taken on the proposed project" or the "no build" alternative is the type of No Project Alternative that is evaluated below for the proposed project. Therefore, under the No Project Alternative, the project site would remain vacant. While this alternative would not meet the project objectives, CEQA requires the alternative to be analyzed.

Commercial Alternative

The Commercial Alternative would result in the development of the project site, but would remove the office and institutional components of the proposed project and increase the acreage proposed for the retail component of the project. This Alternative would include the development of 276,606 square feet (s.f.) of retail building area, which amounts to 169,339 s.f. more retail building area than proposed for the project. Additional retail uses would be located in the central portion of the project site, north of the Sand Creek Road extension, which was originally designated for office and institutional development. All other land use designations would remain the same as the proposed project.

Residential Alternative

The Residential Alternative would result in the development of the project site, but would remove the office and institutional components of the project, and increase the acreage for the residential and retail components of the proposed project. This Alternative would include 162,261 s.f. of retail and 883 residential units, which is 54,994 s.f. and 315 residential units more than the proposed project. Additional residential and office uses would be located in the central portion of the project site, located north of the Sand Creek Road extension, replacing the

institutional and office uses. All other land use designations would remain the same as the proposed project.

Environmentally Superior Alternative

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Section 15126(e)(2) of the *CEQA Guidelines* requires that an environmentally superior alternative be designated and states that "if the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."

Designating a superior alternative depends in large part on what environmental effects one considers most important. This EIR does not presume to make this determination; rather, the determinations of which impacts are more important are left to the reader and the decisionmakers. Finally, it should be noted that the environmental considerations are one portion of the factors that must be considered by the decisionmakers in deliberations on the proposed project and the alternatives. Other factors of importance include urban design, economics, social factors, and fiscal considerations.

For the proposed project, the Environmentally Superior Alternative has been selected based on the differences in the impact categories. For example, the Commercial Alternative would have equal or slightly fewer impacts to Public Services and Utilities and Hazards, as compared to the proposed project, while the Residential Alternative would have slightly increased impacts in these categories. In addition, the Commercial Alternative would result in fewer daily traffic trips, which would result in fewer Air Quality and Noise impacts than the Residential Alternative. It should be noted that the No Project Alternative would reduce impacts in the majority of categories; however, CEQA requires that the Environmentally Superior Alternative be identified among the other alternatives. Given that impacts to traffic, air, and noise are complex and mitigation approaches to these types of issues are often difficult to implement, the Commercial Alternative would be considered the Environmentally Superior Alternative because said Alternative would slightly reduce impacts in these areas.

Summary of Impacts and Mitigation Measures

The following table (Table 2-1) summarizes the impacts identified in the technical chapters (4.1-4.9) of this Draft EIR. In addition, Table 2-1 includes the level of significance of each impact, any mitigation measures required for each impact, and the resulting level of significance after implementation of mitigation measures for each impact.

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
4.2 Land Use			
4.1-1 Compatibility with existing or planned surrounding land uses.	PS	*4.1-1* *Prior to the approval of any permitted use involving the sale of alcohol as the primary means of business (i.e., convenience markets, bars, nightclubs, liquor stores, etc.), drive-thrus, or hours of operation beyond 10:00 pm, the applicant shall be required to prepare a plan detailing the operational and security-related characteristics of the proposed use. Said plan shall be submitted for the review and approval of the Community Development Director and the Chief of Police, and shall be incorporated into the respective design review or tenant improvement permit approval.*	LS
4.1-2 Consistency with adopted General Plan designations and policies.	LS	*4.1-2* *None required.*	N/A
4.1-3 Consistency with existing zoning.	LS	*4.1 -3* *None required.*	N/A
4.1-4 Increases in the intensity of land uses in the region due to the proposed project and all other projects in the Brentwood area.	LS	*4.1-4* *None required.*	N/A
4.2 Aesthetics			
4.2-1 Impacts to scenic vistas and	LS	*4.2-1* *None required.*	N/A

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact		Level of Significance Prior to Mitigation	Mitigation Measures		Level of Significance After Mitigation
	natural resources, including resources found within State scenic highway corridors.				
4.2-2	Impacts related to the existing visual character or quality of the site and surroundings.	LS	*4.2-2*	*None required.*	N/A
4.2-3	Impacts associated with new sources of light and glare.	LS	*4.2-3*	*None required.*	N/A
4.2-4	Long-term impacts to the visual character of the region from the proposed project in combination with existing and future developments in the Brentwood area.	LS	*4.2 -4*	*None required.*	N/A
4.3 Transportation and Circulation					
4.3-1	Impacts to the unsignalized intersection of Brentwood Boulevard and Homecoming Way.	PS	*4.3-1*	*The Brentwood Boulevard / Homecoming Way intersection shall be modified by eliminating left turns from the intersection's westbound approach, to the satisfaction of the City Engineer. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.	
4.3-2 Impacts to the signalized intersection of Brentwood Boulevard and Grant Street / Sunset Road.	PS	*4.3-2* *The Brentwood Boulevard / Grant Street / Sunset Road intersection shall be modified by converting the northbound right-turn lane into a through-right lane and adding a southbound through lane. If the modification is not already completed by others, then the developer shall be responsible for completing it prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. If the modification is completed prior to any development of the site, then the developer shall pay the project's fair share, with each building permit, through the transportation impact fee. The modification shall be completed to the satisfaction of the City Engineer.*	LS
4.3-3 Impacts to the unsignalized intersection of Brentwood Boulevard and Havenwood Avenue.	PS	*4.3-3* *The Brentwood Boulevard / Havenwood Avenue intersection shall be modified by eliminating through and left-turn movements from the intersection's westbound approach, to the*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		satisfaction of the City Engineer. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.	
4.3-4 Impacts to the unsignalized intersection of Brentwood Boulevard and Village Drive.	PS	*4.3-4 The Brentwood Boulevard / Village Drive intersection shall be modified by eliminating left turns from the intersection's westbound approach, to the satisfaction of the City Engineer. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.	
4.3-5 Impacts to bicycle and pedestrian facilities.	LS	*4.3-5* *None required.*	N/A
4.3-6 Impacts to transit facilities.	LS	*4.3 -6* *None required.*	N/A
4.3-7 Cumulative impacts to study intersections.	PS	*4.3-7(a)* *The Brentwood Boulevard / Lone Tree Way intersection shall be modified by converting the southbound through-right lane to a through lane and adding a dedicated right-turn lane. If the modification is not already completed by others, then the developer shall be responsible for completing it prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. If the modification is completed prior to any development of the site, then the developer shall pay the project's fair share, with each building permit, through the transportation impact fee. The modification shall be completed to the satisfaction of the City Engineer.* *4.3-7(b)* *The Brentwood Boulevard / Sunrise Drive intersection shall be modified by eliminating all*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		left- and right-turn movements at the intersection. This improvement is not currently included in the City's CIP. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.	
		4.3-7(c) *The Brentwood Boulevard / Gregory Lane intersection shall be modified by installation of a traffic signal for the intersection. The traffic signal shall be designed to include the Brentwood Boulevard / Beverly Place intersection. This improvement is not currently included in the City's CIP. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.	
		4.3-7(d) *The Brentwood Boulevard / Grant Street / Sunset Road intersection shall be modified by converting the northbound right-turn lane into a through-right lane and adding a southbound through lane. If the modification is not already completed by others, then the developer shall be responsible for completing it prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. If the modification is completed prior to any development of the site, then the developer shall pay the project's fair share, with each building permit, through the transportation impact fee. The modification shall be completed to the satisfaction of the City Engineer.*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		4.3-7(e) *The Brentwood Boulevard / Sand Creek Road intersection shall be modified by converting the southbound through-right lane to a through lane and adding a southbound right turn lane. The developer shall complete the modification prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. The modification shall be completed to the satisfaction of the City Engineer.*	
4.4 Air Quality and Climate Change			
4.4-1 Short-term construction-related air quality impacts.	PS	*4.4-1* *Consistent with guidance from the BAAQMD, prior to issuance of any grading permits, the applicant shall incorporate the following mitigation measures into the construction contract documents, which shall be submitted for the review and approval of the City Engineer:* • *Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives;* • *Cover all trucks hauling soil, sand, and other loose*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		materials or require all trucks to maintain at least two feet of freeboard; • *Pave, apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;* • *Sweep daily (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality;* • *Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets;* • *Apply non-toxic soil stabilizers to inactive construction areas;* • *Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);* • *Limit traffic speeds on unpaved roads to 15 mph;* • *Install sandbags or other erosion control measures to prevent silt runoff to public roadways; and* • *Replant vegetation in disturbed areas as quickly as possible.* *The above measures include all feasible measures for*	

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		construction emissions identified by the Bay Area Air Quality Management District.	
4.4-2 Impacts to regional air quality due to project trip generation.	S	*4.4-2(a)* *Prior to approval of a tentative map or site plan for an individual sub-area, the tentative map or site plan shall show bicycle lanes and/or paths connected to the community-wide network and sidewalks and/or paths connected to adjacent land uses, transit stops, and/or community-wide network, for approval by the Community Development Director and the City Engineer.* *4.4-2(b)* *The BAAQMD has identified mitigation measures for reducing emissions from commercial uses. Prior to approval of a site plan, a transportation management plan shall be created and submitted for the approval of the Community Development Director and the City Engineer. The transportation management plan may include the following measures:* • *Design and locate buildings to facilitate transit access, such as locating local building entrances near transit stops and eliminating building setbacks;* • *Provide secure, weather-protected bicycle parking for employees;* • *Provide safe, direct access for bicyclists to adjacent bicycle routes;*	SU

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SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		• *Provide showers and lockers to employees bicycling or walking to work;* • *Provide secure short-term bicycle parking for retail customers and other non-commute trips;* • *Provide direct, safe, attractive pedestrian access from project to transit stops and adjacent development;* • *Implement carpool/vanpool programs such as carpool ridematching for employees, assistance with vanpool formation or provision of vanpool vehicles;* • *Provide on-site shops and services for employees, such as cafeteria, bank/ATM, dry cleaners, and convenience markets;* • *Provide on-site child care, or contribute to off-site child care within walking distance;* • *Implement parking fees for single occupancy vehicle commuters;* • *Use of exterior and interior paints with low quantities of volatile organic compounds;* • *Implement parking cash-out program for employees (i.e., non-driving employees receive transportation allowances equivalent to value of subsized parking); and* • *Implement parking cash-out program for employees (i.e., non-driving employees receive transportation allowance equivalent to value of subsidized*	

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SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		parking). *4.4-2(c)* *Prior to the issuance of building permits, the applicant shall include in the project design the following measures to the satisfaction of the Community Development Director and the Chief Building Official:* • *Allow only natural gas fireplaces or stoves in single-family houses. Wood, pellet, or traditional open hearth fireplaces shall not be permitted;* • *Use of exterior and interior paints with low quantities of volatile organic compounds;* • *Residences will include outside electrical outlets to allow electric lawn and garden equipment for landscaping; and* • *Utilize reflective (or high albedo) and emissive roofs and light colored construction materials where reasonably practical to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.*	
4.4-5 Impacts to residences located next to State Route (SR) 4 (Brentwood Boulevard).	LS	*4.4-5* *None required.*	N/A

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact		Level of Significance Prior to Mitigation	Mitigation Measures		Level of Significance After Mitigation
4.4-6	Cumulative impacts to regional air quality.	S	*4.4-6*	*Implement Mitigation Measure(s) 4.4-2(a-c).*	SU
4.5 Noise					
4.5-1	Impact of traffic noise level increases at existing land uses in the project area.	LS	*4.5-1*	*None required.*	N/A
4.5-2	Impact of traffic noise at future noise-sensitive land uses developed on project site.	PS	*4.5-2*	*Prior to approval of tentative maps or site plans, the tentative maps or site plans shall show that all outdoor activity areas of residential and commercial uses are shielded from traffic noise, for the review and approval of the Community Development Director and the City Engineer. The shielding shall be achieved through the site design measures (i.e., setbacks, barriers, site design, building façades, and vegetation). Preliminary barrier calculations indicate that barrier heights of approximately 10 feet would be required along Brentwood Boulevard and seven feet along Sand Creek Road. Future detailed analysis may be required by the Community Development Director per future site plan submittals.*	LS
4.5-3	Impacts related to excessive interior noise levels at future noise-sensitive receptors within the project site.	PS	*4.5-3(a)*	*Prior to the issuance of building permits for residential uses constructed at the minimum setback along Brentwood Boulevard, the project design shall include glass windows and doors with the sound transmission*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		class (STC) ratings sufficient to mitigate for the predicted traffic noise levels in Table 4.5-11 under the cumulative plus project scenarios. Final design shall be reviewed and approved by the Chief Building Official and/or City Engineer.	
		4.5-3(b) *Prior to the issuance of building permits for commercial, office, and institutional uses, mechanical ventilation systems shall be included in the project design for the review and approval of the Chief Building Official. The use of mechanical ventilation systems would allow occupants to keep windows and doors closed to achieve acoustical isolation from traffic noise.*	
		4.5-3(c) *Prior to the issuance of building permits for first row residential uses constructed along the Brentwood Boulevard corridor, the project design shall ensure that all attic vents be acoustically baffled in first row residential uses constructed along the Brentwood Boulevard corridor. The baffles shall 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. Final design shall be reviewed and approved by the Chief Building Official.*	
4.5-4 Impacts of commercial noise sources on existing and future	PS	*4.5-4(a)* *During project review, the Community Development Director shall make a determination as to whether or*	LS

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
noise-sensitive uses in the project area.		*not the proposed commercial use would likely generate noise levels that could adversely affect the adjacent residential areas. If the determination is made 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 General Plan 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.* *4.5-4(b)* *Where commercial uses adjoin residential uses, and loading docks or large truck circulation routes adjoin residential areas, prior to design review approval, the following measures shall be included in the project design, for review and approval of the Community Development Director. The following measures may be modified pending more detailed analysis of future development proposals by an acoustical consultant:* • *Loading docks should maintain a minimum distance*	

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		of 100 feet from residential property lines; • *Property line barriers should be a minimum of eight 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, including truck idling and use of refrigeration units, 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 possible;* • *All roof-top exterior heating, cooling and ventilation equipment shall be shielded from view with solid noise barriers, or parapets; and* • *Emergency generators shall comply with the local noise criteria.* *4.5-4(c)* *Prior to approval of site plans within individual sub-areas, the project design shall show, for review and*	

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		approval of the Community Development Director, where commercial land uses are separated from residential areas by local streets, all loading activities should be located on opposite sides of the buildings from residential uses. This mitigation measure may be modified pending more detailed analysis of future development proposals by an acoustical consultant.	
4.5-5 Impacts of neighborhood parks on future noise-sensitive uses within the project area.	PS	*4.5-5* *During site plan consideration for the parks, the City shall ensure that active recreation areas of neighborhood parks are located as far as possible from residential property lines and masonry walls shall be constructed along property lines adjacent to existing residential uses. In addition, neighborhood parks shall only be open from dawn to dusk. Parks shall be large enough to allow playgrounds to be placed appropriate distances from residences. In addition, new residential developments shall be informed of any planned parks in their vicinity.*	LS
4.5-6 Impacts related to construction noise.	PS	*4.5-6(a)* *During construction, the City shall ensure noise-generating activities at the construction site or in areas adjacent to the construction site associated with the project in any way shall be restricted to the hours of 7:30 am to 5:30 pm, Monday through Saturday. Construction is prohibited on Sundays and City holidays*	LS

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		unless prior authorization from the Community Development Director is obtained. *4.5-6(b)* *Prior to the approval of the Improvement Plans or initiation of any grading or construction activity, the applicant/developer shall include the following mitigation measures on the plans to be approved by the City Engineer:* • *Equip all equipment driven by internal combustion engines with intake and exhaust mufflers that are in good condition and appropriate to the equipment. Unnecessary idling of internal combustion engines should be strictly prohibited;* • *Stationary noise-generating equipment, such as air compressors or portable power generators, must be located the greatest distance applicable from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses;* • *Utilize "quiet" air compressors and other stationary noise sources where technology exists;* • *Designate a "disturbance coordinator" who would be responsible for responding to any local complaints regarding construction noise. The*	

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		disturbance coordinator will determine the cause of the noise complaints (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented; and • *Notify prospective residents within the adjacent subdivision that the development of the commercial portion of the site would generate noise levels during construction that may be considered excessive or annoying.*	
4.5-7 Impacts related to construction vibration.	LS	*4.5-7* *None required.*	N/A
4.5-8 Cumulative impacts as a result of project-related traffic on existing noise-sensitive uses adjacent to the project site.	PS	*4.5-8* *Implement Mitigation Measure 4.5-2.*	LS
4.6 Biological Resources			
4.6-1 Impacts to jurisdictional Waters of the United States and waters of the State.	LS	*4.6-1* *None required.*	N/A
4.6-2 Impacts to special-status plants.	PS	*4.6-2* *Prior to the issuance of grading permits, the applicant shall ensure that a pre-construction survey for special-status plant species is conducted prior to commencement of construction activities,*	LS

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		for the review and approval of the Community Development Director and the California Department of Fish and Game. The survey is to be done to verify the continued absence of special-status plant species identified in the previous surveys.	
4.6-3 Impacts to burrowing owl.	PS	*4.6-3(a)* *Prior to the issuance of grading permits, the applicant shall ensure that pre-construction surveys are conducted between April 15 and July 15 by a qualified biologist within the project area to determine the presence of burrowing owls during the height of the nesting season. The survey is to be completed in accordance with the survey requirements of the CDFG and protocol for the California Burrowing Owl Consortium (CBOC) and submitted to the Community Development Director. If site disturbance does not commence within 30 days of the nesting season survey, an additional survey shall be conducted prior to construction.* *If site disturbance commences during the nesting season, between February 1 and August 31, and burrowing owls are detected on or within 250 feet of the on-site construction areas, a fenced buffer shall be installed not less than 250 feet between the nest burrow(s) and construction activities. The 250 foot*	LS

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		buffer shall be observed and the fence left intact until a qualified biologist determines that the young are foraging independently, the nest has failed, or the owls are not using any burrows within the buffer. *4.6-3(b)* *Prior to the issuance of grading or construction permits for the project site, the applicant shall pay the applicable HCP/NCCP per-acre fee in effect. Once the per-acre fee is paid, the City will verify that the HCP/NCCP permit terms and conditions have been met and issue take authorization under the HCP/NCCP.*	
4.6-4 Impacts to Swainson's hawk.	PS	*4.6-4(a)* *Prior to the issuance of grading permits, the applicant shall ensure that pre-construction surveys are conducted between February and August by a qualified biologist within the project area and within a 0.5 mile radius of the project boundary. If nests are not found during the pre-construction survey, further action is not required, other than payment of HCP/NCCP mitigation fees, and required compliance with HCP/NCCP Mitigation Measure 4.6-3(b). If active nests are found, the findings shall be submitted to CDFG and a buffer zone of a minimum of one-quarter mile shall be established around the active nest. Intensive new disturbances, such as heavy equipment activities associated with construction that may cause nest*	LS

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		abandonment or forced fledging, shall not be initiated within this buffer zone between March 1 and September 1. Any trees containing nests that must be removed as a result of project implementation shall be removed during non-breeding season between September and January.	
4.6-5 Impacts to nesting raptors and other migratory birds.	PS	*4.6-5* *If site disturbance commences during the nesting season (February 1 through August 15), a pre-construction survey shall be conducted by a qualified wildlife biologist within 15 days of the start of project-related activities. If nests are not found during the pre-construction survey, further action is not required, other than payment of HCP/NCCP mitigation fees, and required compliance with Mitigation Measure 4.6-3(b). If nests of migratory birds are detected on site or within 75 feet (for migratory passerine birds) or 250 feet (for birds of prey) of the site, the applicant shall observe no-disturbance buffers of 75 feet for migratory passerine and 250 feet for birds of prey until August 15, or the qualified biologist determines that the young are foraging independently, or the nest has been abandoned.* *Removal of any potential nesting trees or shrubs shall occur between September 1 and January 31, outside of the general avian nesting season. If removal of any potential nesting trees or shrubs occurs, or construction*	LS

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		begins, between February 1 and August 31 (nesting season for passerine or non-passerine land birds) or December 15 and August 31 (nesting season for raptors), the applicant shall have a nesting bird survey performed. The survey shall be done for the review and approval of the Community Development Director, by a qualified biologist within 14 days prior to the removal or disturbance of potential nesting trees or shrubs, or the initiation of other construction activities during the early part of the breeding season (late December through April) and not more than 30 days prior to the initiation of these activities during the late part of the breeding season (May through August). During this survey, a qualified biologist shall inspect all potential nesting habitat (trees, shrubs, grasslands, pastures, etc.) in and immediately adjacent to the impact areas for nests. *Active nests shall be flagged and an appropriate non-disturbance buffer zone shall be established around the nesting trees or shrubs. The size of the buffer zone shall be determined by the project biologist in consultation with CDFG and will depend on the species involved, site conditions, and type of work to be conducted on the project site. Typically, if active nests are found, construction activities shall not take place within 250*	

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		feet of the raptor nests and within 75 feet of other migratory birds until the young have fledged. A qualified biologist shall monitor active nests to determine when the young have fledged and are feeding on their own. The qualified biologist and CDFG shall be consulted for clearance before construction activities resume on the project site.	
4.6-6 Impacts related to interference with the movement of native wildlife.	LS	*4.6-6 None required.*	N/A
4.6-7 Impacts related to conflicts with local policies and ordinances.	LS	*4.6-7 None required.*	N/A
4.6-8 Impacts to existing trees.	PS	*4.6-8 Prior to deeming complete site-specific applications for parcels located within the proposed project site, the site plan(s) shall identify all non-orchard trees within the site plan area that are at least in "good" condition (based on the arborist report prepared for the project site), which shall be protected from damage, to the satisfaction of the Community Development Department, and shall be identified on the grading plan. Appropriate protective measures shall be taken to ensure preservation during grading activity and after project occupancy. Any non-orchard tree in at least "good" condition that cannot be preserved in place*	LS

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				shall be relocated or replaced, to the satisfaction of the Community Development Department.	
4.6-9	Cumulative loss of biological resources in the City of Brentwood and the effects of ongoing urbanization in the region.	PS	*4.6-9*	*Implement Mitigation Measures 4.6-1 through 4.6-8.*	LS
4.7 Cultural Resources					
4.7-1	Disturbance or destruction of archaeological resources on the project site.	PS	*4.7-1(a)*	*During ground disturbance activities, if any earth-moving activities uncover any concentrations of stone, bone or shellfish, any artifacts of these materials, or any evidence of fire (ash, charcoal, fire altered rock, or earth), all work shall be halted in the vicinity of the find and a qualified archaeologist shall be contacted immediately to make an evaluation to assess possible historic importance or prehistoric significance. If warranted by the discovery of a concentration of artifacts or soil deposits, further work in the discovery area shall be monitored by an archaeologist.* *If the discovery appears to be an isolated find, monitoring of excavation in the vicinity would be appropriate to confirm this. However, if the discovery appears indicative of a more complex deposit, archaeological investigation shall be undertaken and a limited subsurface test procedure (auger test) shall be*		LS

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		performed in the discovery location to determine if any culturally modified soils or more concentrated artifactual remains are present at greater depths.	
		4.7-1(b) *In the event that any archaeological deposits are discovered during construction or grading, work in the vicinity of the discovery shall be halted until a plan has been submitted to the Community Development Director for the evaluation of the resource, as required under current CEQA Guidelines. In addition, the following standard archaeological monitoring and spot check procedures shall be implemented in the vicinity of the discovery, following an investigation that determines that potentially significant discoveries have been made:*	
		• *Monitoring shall consist of directly watching the major excavation process. Monitoring shall occur during the entire work day, and shall continue on a daily basis until a depth of excavation has been reached at which resources could not occur. This depth is estimated as usually about five feet below grade at the beginning of the project, but may require modification in specific cases, and shall be determined by the monitoring archaeologist based on observed soil conditions. Spot checks shall consist of partial monitoring of the progress of*	

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		excavation over the course of the project. During spot checks, all spoils material, open excavations, recently grubbed areas, and other soil disturbances shall be inspected to determine if cultural materials are present. The frequency and duration of spot checks shall be based on the relative sensitivity of the exposed soils and active work areas. The monitoring archaeologist shall determine the relative sensitivity of the parcel. • *If prehistoric human interments (human burials or skeletal remains) are encountered within the native soils of the parcel, all work should be halted in the immediate vicinity of the find. The County Coroner, project superintendent, and the Agency Liaison shall be contacted immediately.* • *If significant cultural deposits other than human burials are encountered, the project shall be modified to allow the artifacts or features to be left in place, or the archaeological consultant shall undertake the recovery of the deposit or feature. Significant cultural deposits are defined as archaeological features or artifacts that associate with the prehistoric period, the historic era (Mission and Pueblo Periods), and the American era up to about 1950.* • *Whenever the monitoring archaeologist suspects*	

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		that potentially significant cultural remains or human burials have been encountered, the piece of equipment that encounters the suspected deposit shall be stopped, and the excavation inspected by the monitoring archaeologist. If the suspected remains prove to be non-significant or non-cultural in origin, work shall recommence immediately. • *If the suspected remains prove to be part of a significant deposit, all work shall be halted in that location until appropriate recordation and (possible) removal has been accomplished. If human remains (burials) are found, the County Coroner shall be contacted to evaluate the discovery area and determine the context; not all discovered human remains reflect Native American origins. However, in all cases where prehistoric or historic era Native American resources are involved, the Native American Heritage Commission shall be contacted to designate appropriate representatives of the local Native American community, who also should be contacted about their concerns.* • *Equipment stoppages shall only involve those pieces of equipment that have actually encountered significant or potentially significant deposits, and should not be construed to mean a stoppage of all equipment on the site unless the cultural deposit*	

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		covers the entire building site. • *During temporary equipment stoppages brought about to examine suspected remains, the archaeologist shall accomplish the necessary tasks with all due speed.* *4.7-1(c)* *During construction, if bone is uncovered that may be human, the California Native American Heritage Commission, located in Sacramento, and the Contra Costa County Coroner shall be notified. Should human remains be found, all work shall be halted until final disposition by the Coroner. Should the remains be determined to be of Native American descent, the Native American Heritage Commission shall be consulted to determine the appropriate disposition of such remains. In addition, a qualified archaeologist shall be notified immediately so that an evaluation of the remains and the site can be performed.*	
4.7-2 Impacts to historical structures.	LS	*4.7-2* *None required.*	N/A
4.7-3 Disturbance or destruction of previously unknown archaeological resources in combination with other development in the Brentwood area.	PS	*4.7-3* *Implement Mitigation Measures 4.7-1(a) through 4.7-1(c).*	LS

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4.8 Hazards					
4.8-1	Impacts related to exposure to manmade asbestos and lead-based paint.	LS	*4.8-1*	*None required.*	N/A
4.8-2	Impacts related to the presence of gas wells.	PS	*4.8-2(a)*	*Prior to the issuance of grading permits for Sub-Area 5A, the applicant shall provide a "No Further Action Required" letter from the RWQCB for review by the Contra Costa County Environmental Health Department and the Brentwood Community Development Director and Public Works Department.*	LS
			4.8-2(b)	*Prior to the approval of any development within Subareas 3A, 3B, 4, or 5A, the applicant shall demonstrate compliance with Chapter 17.680 of the Brentwood Municipal Code (Oil and Gas Production), to the satisfaction of the Community Development Director.*	
4.8-3	Impacts related to the presence of pesticide and/or herbicide residues on the project site.	LS	*4.8-3*	*None required.*	N/A
4.8-4	Impacts related to soil contamination from the presence of underground storage tanks and agricultural irrigation wells.	PS	*4.8-4(a)*	*During grading and construction activities, if Underground Storage Tanks are encountered, the applicant shall hire a licensed contractor to remove the USTs. In addition, the applicant shall obtain a permit from Contra Costa County Environmental Health*	LS

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		Department, and properly remove the UST, per review and approval of the Contra Costa County Environmental Health Department. If soils suspected of being contaminated are encountered, they shall be removed in accordance with RWQCB guidelines. Further remediation, if necessary, and disposal of the soils shall be conducted in accordance with State and federal guidelines.	
		4.2-4(b) *During grading and construction activities, if septic systems are encountered, the applicant shall hire a licensed contractor to remove the septic systems. In addition, the applicant shall obtain a permit from Contra Costa County Environmental Health Department, and properly abandon/decommission the septic system, per review and approval of the Contra Costa County Environmental Health Department. If soils suspected of being contaminated are encountered, they shall be stockpiled on plastic sheeting. Stockpiled soils shall be sampled in accordance with RWQCB guidelines, and the findings forwarded to the RWQCB for review. Further remediation, if necessary, and disposal of the soils shall be conducted in accordance with State and federal guidelines.*	
		4.8-4(c) *Prior to initiation of any ground disturbance activities*	

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		within 50 feet of a well, the applicant shall hire a licensed well contractor to obtain a well abandonment permit from Contra Costa County Environmental Health Department, and properly abandon the on-site wells, per review and approval of the Contra Costa County Environmental Health Department.	
4.8-5 Impacts related to coccidioidomycosis.	PS	*4.8-5(a)* *Prior to construction, the project applicant shall initiate a training and education program for construction workers on-site, as indicated in the Report on Control of Coccidioides immitis (Valley Fever), which was issued in August 1995 by the Kern County Department of Public Health's Valley Fever Task Force. The program shall be reviewed and approved by the Community Development Director.* *4.8-5(b)* *During construction, the project contractor shall comply with all dust control measures and procedures issued by the Bay Area Air Quality Management District (BAAQMD) in order to decrease exposure to arthrospores present in soil and dust. In addition, all applicable local and State regulations shall be complied with including, but not limited to, the California Labor Code and Title 8 of the California Code of Regulations, Section 3203, which addresses respiratory protection and general industry safety orders, and requires*	LS

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				employers to have Injury and Illness Prevention Plans.	
4.8-6	Impacts related to wildland fires.	LS	*4.8-6*	*None required.*	N/A
4.8-7	Impacts related to ground shaking.	PS	*4.8-7*	*Prior to issuance of a grading permit, the project applicant shall submit and comply with the recommendations in site-specific Geology and Soils Assessment, at the discretion of the City Engineer. The assessment shall be reviewed and approved by the City Engineer or his/her designee. The Geology and Soils Assessment must include, but not be limited to, an assessment of impacts related to ground shaking and include mitigation to minimize harm to structures and humans, including compliance with the latest CBC regulations relating to ground shaking.*	LS
4.8-7	Impacts related to operational hazard-related residential, office, and institutional uses.	LS	*4.8-7*	*None required.*	N/A
4.8-8	Long-term hazards-related impacts from the proposed project in combination with existing and future developments in the Brentwood area.	LS	*4.8-8*	*None required.*	N/A
4.9 Public Services and Utilities					
4.9-1	Adequate water supply and delivery for new residents.	PS	*4.9-1(a)*	*Prior to issuance of building permits, the applicant shall be required to pay the City's Water Development Impact*	LS

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			Fees.	
		4.9-1(b)	*Prior to issuance of building permits, the applicant shall construct and/or show proof of payment of fair-share fees for sizing and construction of water infrastructure to service the project, for review and approval of the Public Works Department.*	
4.9-2 Adequate wastewater facilities for new residents.	PS	*4.9-2(a)*	*Prior to issuance of building permits, the applicant shall be required to pay the City's Wastewater Impact Development Impact Fees.*	N/A
		4.9-2(b)	*Prior to issuance of building permits, the applicant shall construct and/or show proof of payment of fair-share fees for sizing and construction of wastewater infrastructure to service the project, for review and approval of the Public Works Department.*	
4.9-3 Adequate storm drainage facilities for the proposed project.	LS	*4.9-3*	*None required.*	N/A
4.9-4 Need for additional waste disposal/recycling services.	LS	*4.9-4*	*None required.*	N/A
4.9-5 Adequate ratio of law enforcement personnel to residents.	PS	*4.9-5*	*Prior to issuance of building permits, the applicant shall participate in an existing or new CFD, to the satisfaction of the City Engineer.*	LS
4.9-6 Adequate fire protection services	PS	*4.9-6(a)*	*Prior to issuance of building permits, the applicant shall*	LS

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available to new residents.		*comply with all applicable requirements of the Uniform Fire Code and the adopted policies of the East Contra Costa Fire Protection District. The Chief Building Official shall review the building plans to ensure compliance.*	
		4.9-6(b) *Prior to issuance of building permits, the applicant shall provide an adequate and reliable water supply for fire protection with a minimum fire flow of 2,000 gallons per minute (GPM). The required fire flow shall be delivered from not more than two fire hydrants flowing simultaneously while maintaining 20 pounds of residual pressure in the main. The City Engineer shall ensure the minimum fire flow requirements are satisfied. Flow requirements will be determined by the ECCFPD prior to issuance of encroachment and/or building permits. The developer shall provide the number and type of fire hydrants required by ECCFPD and the City Engineer. Hydrant locations will be determined by the ECCFPD and the City Engineer prior to building and/or encroachment permit issuance. All applicable connection fees shall be paid at the time of permit issuance.*	
		4.9-6(c) *Prior to construction involving use of flammable materials, the developer shall provide access driveways*	

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		having all-weather driving surfaces of not less than 20' unobstructed width and not less than 13'6" of vertical clearance to within 150 feet of travel distance to all portions of the exterior walls of every building. Access driveways shall not exceed 16 percent grade, shall have a minimum outside turning radius of 42 feet, and must be capable of supporting imposed loads of fire apparatus (37 tons). Center divide medians on any access roadways shall leave a minimum remaining lane width of 16 feet on each side. Median length shall not exceed 150 feet when a 16-foot lane width is used. A rolled curb and an unobstructed drivable surface on the median may be used to assist with meeting apparatus turning radius requirements. The City Engineer shall ensure compliance. *4.9-6(d)* *Prior to encroachment and/or building permit issuance for improvements, the developer shall submit plans and specifications to the ECCFPD and the City Engineer for review and approval in accordance with codes, regulations, and ordinances administered by the ECCFPD and the State Fire Marshal's office.*	
4.9-7 Number of enrolled students exceeding capacity.	PS	*4.9-7* *Prior to issuance of building permits, the applicant shall be required to pay school impact fees.*	LS
4.9-8 Adequate provision of parks and recreation space for new	PS	*4.9-8* *Prior to the recordation of final maps, the applicant shall either dedicate the required amount of park land*	LS

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residents.		*or pay in lieu fees, for the review and approval of the Community Development Director and the Parks and Recreation Director.*	
4.9-9 Project impacts on the City of Brentwood Library.	PS	*4.9-9* *Prior to the recordation of final maps, the Applicant shall pay its fair share for additional library facilities and/or services by participating in an existing or new CFD at the discretion of the Community Development Director.*	LS
4.9-10 Impacts to natural gas and electric facilities.	PS	*4.9-10(a)* *Prior to issuance of building permits, applicants shall consult with PG&E and the City of Brentwood to determine the adequacy of existing natural gas and electric facilities to serve the project. The applicant shall be required to pay the project's fair share cost towards the construction of needed improvements identified by PG&E and the City of Brentwood.* *4.9-10(b)* *Prior to initiation of construction activities, the project contractor shall coordinate with PG&E and the City Engineer to identify the location of existing PG&E utilities and determine if relocation of utilities is necessary. If relocation is deemed necessary, prior to construction within existing PG&E utility easements, the contractor shall work with PG&E and the City Engineer to establish a utilities relocation plan, which shall include methods to ensure the provision of utilities during construction of the project.*	

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4.9-11 Impacts to telephone and cable service.	LS	*4.9-11* *None required.*	N/A
4.9-12 Increase in demand for additional public services and utilities as a result of the proposed project and other projects proposed in the Brentwood area.	LS	*4.9-12* *None required.*	N/A
Initial Study			
VI. Geology and Soils.	PS	*VI-1.* *Prior to issuance of grading permits, the project applicant shall submit, for the review and approval of the City Engineer, an erosion control plan that utilizes Best Management Practices (BMPs) to limit the erosion effects during construction of the proposed project. Measures could include, but are not limited to:* • *Hydro-seeding;* • *Placement of erosion control measures within drainageways and ahead of drop inlets;* • *The temporary lining (during construction activities) of drop inlets with "filter fabric" (a specific type of geotextile fabric);* • *The placement of straw wattles along slope contours and back-of-curb prior to installation of landscaping;*	LS

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		• *Directing subcontractors to a single designation "wash-out" location (as opposed to allowing them to wash-out in any location they desire);* • *The use of siltation fences; and* • *The use of sediment basins and dust palliatives.* *VI-2.* *Prior to the approval of Improvement Plans and building permits, the project proponent shall submit a design-level geotechnical study to the City Engineer for review and approval, which specifically addresses whether expansive soils or soils prone to liquefaction are present in the development area, and includes measures to address these soils where they occur. All grading and foundation plans designed by the project Civil and Structural Engineer must be reviewed and approved by the City Engineer and Chief Building Official prior to issuance of grading and building permits to ensure that all geotechnical recommendations specified in the geotechnical report are properly incorporated and utilized in design. In addition, the applicant of the proposed project shall comply with UBC standards.* *VI-3.* *Implement Mitigation Measure VI-2.*	
VIII. Hydrology and Water Quality.	PS	*VIII-4.* *Prior to the issuance of grading permits, the applicant shall obtain and comply with the NPDES General*	LS

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Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		Construction Permit, including the submittal of a Notice of Intent (NOI) and associated fee to the SWRCB, and the preparation of a Storm Water Pollution Prevention Plan (SWPPP) for review and approval of the City Engineer. The SWPPP shall serve as the framework for identification, assignment, and implementation of Best Management Practices (BMPs). The developer shall implement BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable. The SWPPP shall be submitted to the City Engineer for review and approval and shall remain on the project site during all phases of construction. Following implementation of the SWPPP, the developer shall subsequently demonstrate the SWPPP's effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in stormwater discharges to the maximum extent practicable.	
		VIII-5. Prior to the issuance of building permits, the design of drainage facilities for the project shall meet with the approval of both the City Engineer and the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD).	

MM = *Mitigation Measure;* NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; S = *Significant*; SU = *Significant and Unavoidable*

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impact	Level of Significance Prior to Mitigation	Mitigation Measures	Level of Significance After Mitigation
		VIII-6. Prior to the issuance of building permits, the project applicant shall pay CCCFCWCD drainage fees for the project site.	

MM = *Mitigation Measure;* NI = *No Impact*; N/A = *Not Applicable*; LS = *Less-than-Significant*; S = *Significant*; SU = *Significant and Unavoidable*

3. PROJECT DESCRIPTION

3 PROJECT DESCRIPTION

Introduction

This chapter provides a comprehensive description of the proposed project, including the project setting, background, objectives, components, and required public approvals. The detailed information provided in this chapter forms the basis for the environmental analysis and assessment in the following technical chapters.

Project Setting

This section presents details regarding the existing regional and local setting of the project site as well as the existing project site characteristics.

Regional Setting

The City of Brentwood is located in the eastern valley area of Contra Costa County immediately east of the Diablo Range, on the western edge of the San Joaquin Valley (See Figure 3-1, Regional Location Map). The City has historically been surrounded by agricultural land uses consisting primarily of row crops, orchards, and grazing lands. The City's planning area is located southeast of Antioch and south of the City of Oakley and Bethel Island. The planning area consists of approximately 66 square miles, and is characterized by the relatively flat terrain of the Central Valley, with gently sloping hills in the western and southwestern portion of the area approaching the foothills of the Diablo Range. The distant eastern slopes of the Diablo Range, gently rolling hills, and grassy, tree-studded hills comprise the surrounding visual character of Brentwood. Rising to an elevation of 3,849 feet above sea level, Mount Diablo is the main visual feature outside the Brentwood planning area, and is a prominent landmark dominating the western skyline.

Local Setting

The proposed project site is located within the northeastern portion of the City of Brentwood. The project site is within the North Brentwood Redevelopment Area and also within the limits of the proposed Brentwood Boulevard Specific Plan (BBSP) area, which is a draft document currently being reviewed by the City. The project site is located at the intersection of Sand Creek Road and Brentwood Boulevard (State Route 4) and is approximately 65 acres (See Figure 3-2, Project Location). Sand Creek Road is planned to extend through the project site in the future. The project site consists of two parcels identified by Assessor's Parcel Numbers (APNs) 016-170-012 and -013. The project site is surrounded by residential development to the east, north, and south, and commercial to the west.

Figure 3-1
Regional Location Map

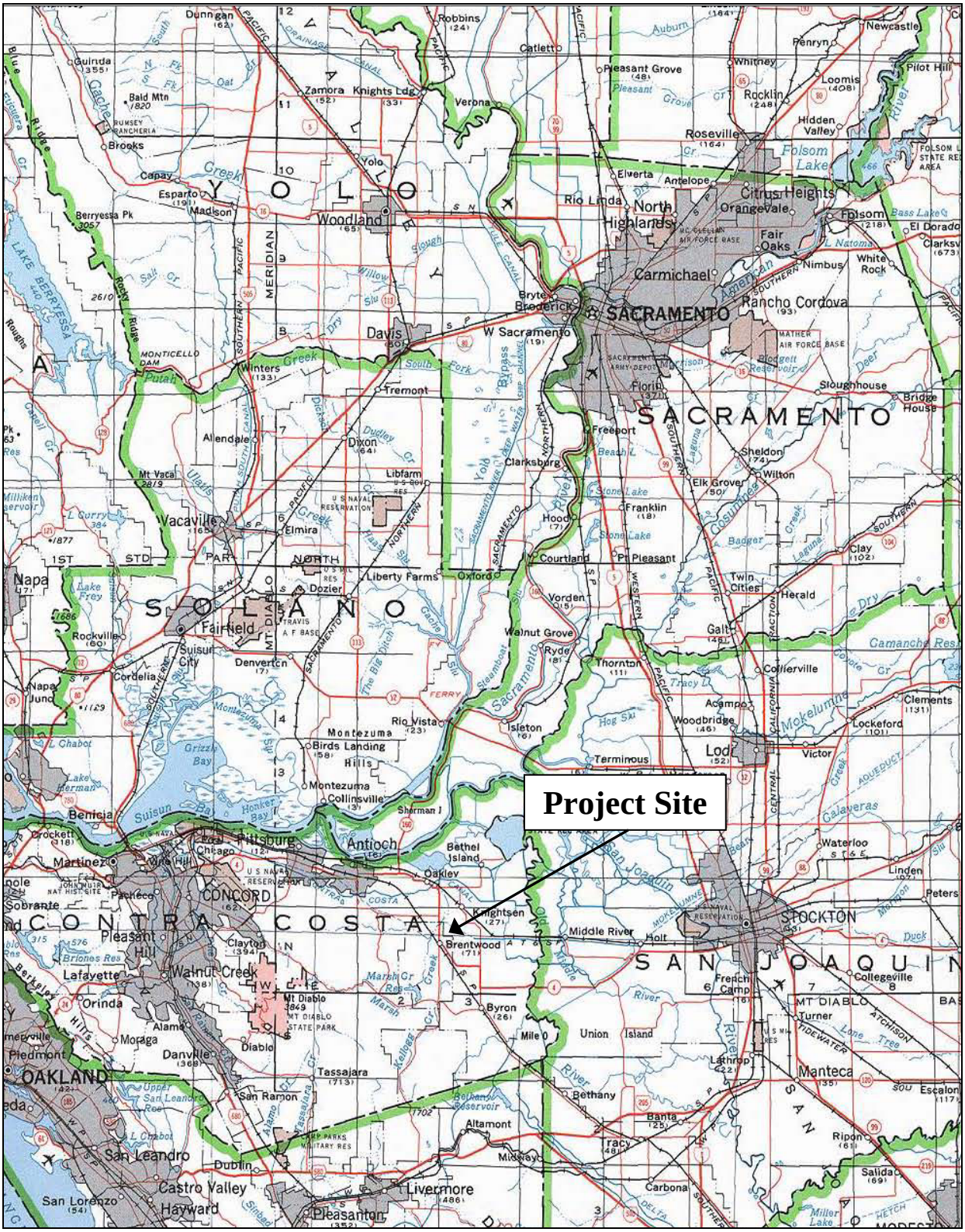


Figure 3-2
Project Location Map

Site Characteristics

The project site primarily consists of vacant land. However, a natural gas well exists in the northeastern portion of the site, and near the western boundary, evidence of a former agricultural residence with associated buildings exists, as well as an inactive water well The site has been disked, and was historically used for agriculture.

The City of Brentwood General Plan land use designations for the project site include Mixed-Use Business Park (BP) and Very High Density Residential (VHDR). The project site is located in the City's North Brentwood Redevelopment Area. The surrounding General Plan land use designations include General Commercial (GC), Medium Density Residential (MDR), and Low Density Residential (LDR). The current zoning designation for the project site is Planned Development (PD)-55. Existing zoning designations surrounding the project site include Neighborhood Commercial (C-1) to the south of the site, General Commercial (C-2) to the west, Commercial/Office/Business (COB) to the west, Moderate Density Multi-Residential (R-2) to the north and south, Planned Development (PD) -42 to the southwest, and Planned Development (PD)-46 to the east.

Project Background and Context

The Sciortino Ranch project site was formerly used for agricultural operations. In the late 1980s, a fire destroyed many of the agricultural buildings on-site. Although the buildings were removed, concrete pads associated with the former buildings remain. The proposed project is designated in the City of Brentwood General Plan as Special Planning Area A. The Special Planning Area A design objectives include development of commerce and office along State Route 4 (SR4). In addition, the project site is located within the proposed BBSP area. The project applicant has decided to process the proposed project separate from the BBSP, given the fact that the BBSP is still undergoing review and consideration by City staff. However, it should be noted that the proposed development standards would be compatible with the proposed design objectives of the BBSP.

Project Objectives

The objectives for the proposed project are as follows:

1. Establish zoning and Design Guidelines via amendments to the Planned Development Zone (PD-55) and the General Plan to allow future commercial and residential development.

2. Future construction of residential units and retail/office/institutional developments.

3. Enhance the economic success of the neighborhood commercial components near State Route 4 by including nearby dwelling units.

4. Provide a range of commercial and housing types to meet the needs of a diverse population;

5. Provide affordable housing consistent with City and State redevelopment laws.

6. Provide new development consistent with City and State redevelopment laws.

7. Provide retail shopping opportunities to serve the surrounding community.

8. Subdivide property into 11 new parcels in accordance with new zoning sub-areas.

Project Components

General Plan and Planned Development Zone Amendments

The proposed project includes the establishment of zoning that includes park, multi-family residential and single-family residential, retail, office, commercial, and/or institutional uses. The amended PD-55 zone would divide the proposed project site into 11 new parcels.

A General Plan Amendment is required because the proposed land uses are not consistent with those identified in the General Plan or Special Planning Area (SPA-A) text. The General Plan and Map would be modified to recognize the SPA-A that includes amendments to be consistent with the amended PD-55 Zone.

For the purposes of analysis, this document uses a conservative approach and assumes an intense level of development, as shown in Table 3-1. The assumptions in Table 3-1 were used to assess impacts to transportation and circulation and, subsequently, noise and air quality. Future development of the site would include the extension of Sand Creek Road, which would traverse the site from east to west.[1] Analysis of the potential development includes 5.1 acres of park, up to 468 multi-family apartments, 140 single-family detached homes, 107,267 sq. ft. of retail uses, 87,991 sq. ft. of office uses, and 228,690 sq. ft. of institutional uses.

Vesting Tentative Subdivision Map

The proposed project includes a vesting tentative subdivision map that subdivides two legal parcels (APNs 016-170-012 and -013) into 11 new parcels, consistent with the proposed PD-55 sub-zone areas (See Figure 3-4, Vesting Tentative Subdivision Map). End users or development plans are not currently proposed. This EIR has made assumptions regarding the number of dwelling units and square footages of different commercial uses.

1 Sand Creek Road extension was analyzed and approved as part of the previous Barrington project entitlements.

Figure 3-3
PD-55 Zoning Development Sub-Area Map

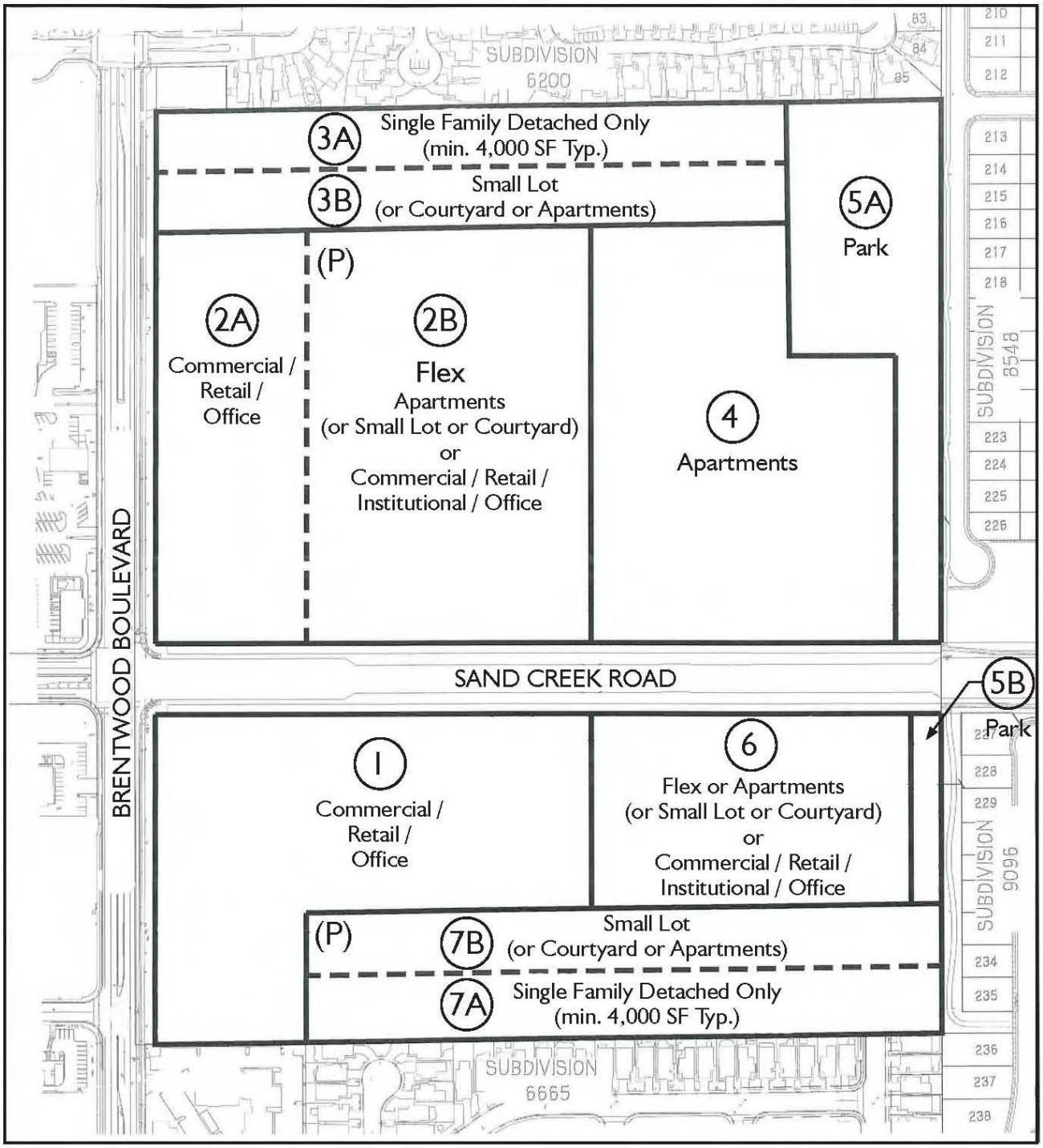


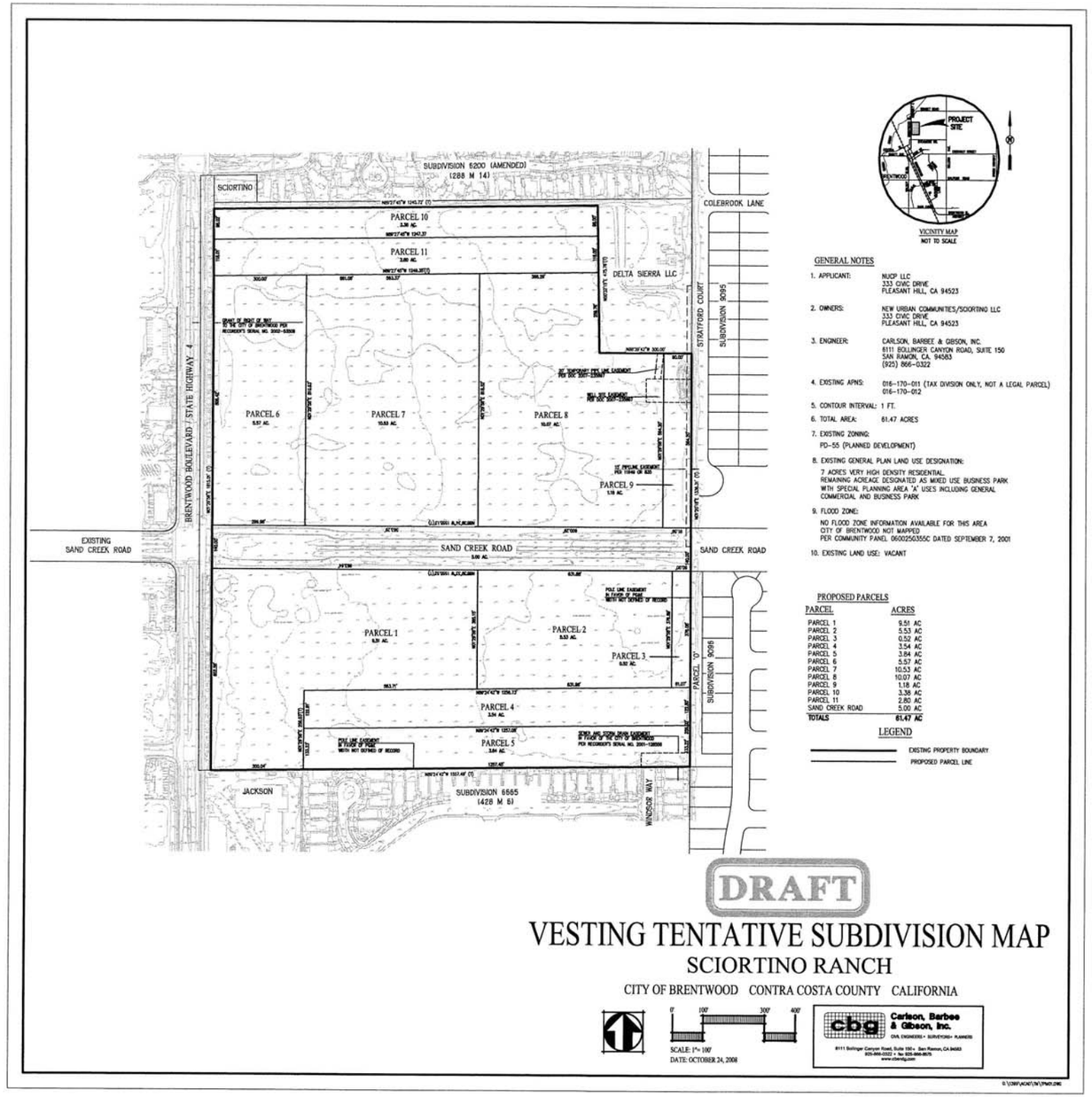
Table 3-1
Land Use Assumptions for Analysis

Sub Areas	Acreage	Fixed Park Acreage	# of MFD Apartment (DUs)	# of SFH Detached (DUs)	Retail (Sq. Ft.)	Office (Sq. Ft.)	Institutional (Sq. Ft.)
Sub-Area # 1	9.4	-	-	-	47,372	87,991	-
Sub-Area # 2A	5.5	-	-	-	59,895	-	-
Sub-Area # 2B	10.5	-	-	-	-	-	228,690
Sub-Area # 3A	3.4	-	-	27	-	-	-
Sub-Area # 3B	3.3	-	-	40	-	-	-
Sub-Area # 4	10.1	-	303	-	-	-	-
Sub-Area # 5A	4.6	4.6	-	-	-	-	-
Sub-Area # 5B	0.5	0.5	-	-	-	-	-
Sub-Area # 6	5.5	-	165	-	-	-	-
Sub-Area # 7A	3.8	-	-	30	-	-	-
Sub-Area # 7B	3.6	-	-	43	-	-	-
TOTALS:	**60.2**	**5.1**	**468**	**140**	**107,267**	**87,991**	**228,690**

Notes: The following are the assumed densities for each proposed residential sub-area: 3A = 8 du/ac, 3B = 12 du/ac, 4 = 30 du/ac, 6 = 30 du/ac, 7A = 8 du/ac, 7B = 12 du/ac. The following are the assumed floor-to-area ratios (FAR) for the non-residential uses: Retail = 25%, Office = 40%, Institutional = 50%). The table excludes approximately five acres of land dedicated to the Sand Creek Road right-of-way.

DU = Dwelling Units
Sq. Ft. = Square Feet
MFG = Multi-Family Dwellings
SFH = Single-Family Housing

Figure 3-4
Vesting Tentative Subdivision Map



PD-55 Zoning Matrix and Design Guidelines

Permitted and Conditionally Permitted land uses are described for each zoning sub-area per a Zoning Matrix that is a component of the Planned Development 55 zone (See Table 3-1). The zoning matrix describes the regulated uses for this mixed use project area. The PD-55 zone is inclusive of the matrix and the associated Sciortino Ranch Design Guidelines. The guidelines define acceptable site planning and architectural design elements (e.g., setbacks, building heights) and addresses transitions between commercial and residential type land uses. The Draft Design Guidelines are included as Appendix D to this environmental impact report.

Infrastructure

The project site is an infill site served by two major arterial roads and associated existing infrastructure. Brentwood Boulevard is located along the western border of the site, and Sand Creek Road is currently stubbed to the site with the planned future extension of Sand Creek Road through the project site. Both existing roadways contain several existing wet and dry utilities. Brentwood Boulevard includes a 15-inch sanitary sewer line, a 66-inch storm drain pipe, a 16-inch water main, a four-inch gas main, underground telephone lines, overhead utility poles with Pacific Gas & Electric (PG&E) 21 kilovolt (kV), and AT&T services. Similar wet and dry utilities are located near the eastern project terminus of Sand Creek Road. Existing utilities at this location include a 10-inch sewer line, a 42-inch storm drain pipe, a 12-inch non-potable water main, a 20-inch water main, and joint trench facilities including PG&E gas and electric, cable, telephone, and fiber optic lines.

Required Public Approvals

The Sciortino Ranch project requires the following discretionary actions by the Brentwood Planning Commission and/or City Council:

1) Certification of the EIR;
2) Approval of a General Plan Amendment;
3) Approval of an amendment to the PD-55 zone inclusive of a Sub-Area Map, Zoning Matrix, and associated Design Guidelines; and
4) Approval of a Vesting Tentative Subdivision Map to subdivide the site into eleven parcels.

4. ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION

4.0 INTRODUCTION TO THE ANALYSIS

4.0 INTRODUCTION TO THE ANALYSIS

Introduction

Chapter 4 analyzes the potential impacts of buildout of the Sciortino Ranch project on a range of environmental issue areas. Technical chapters 4.1 through 4.9 describe the focus of the analysis, references and other data sources for the analysis, the environmental setting as the setting relates to the specific issue, project-specific impacts and mitigation measures, and cumulative impacts of the proposed project for each issue area. The format of each of these technical chapters is described below.

Determination of Significance

Under CEQA, a significant effect is defined as a substantial or potentially substantial adverse change in the environment (Public Resources Code §21068). The Guidelines implementing CEQA state that this determination must be based on scientific and factual data. The specific criteria for determining the significance of a particular impact are identified within the impact discussion in each chapter, and are consistent with significance criteria set forth in the CEQA Guidelines.

Initial Study

The Initial Study prepared for the Sciortino Ranch project as a part of this EIR includes a detailed environmental checklist addressing a range of technical environmental issues (See Appendix C). For each technical environmental issue, the Initial Study identifies the level of impact for the proposed project. The Initial Study identifies the environmental effects as either "no impact," "less-than-significant," "potentially significant unless mitigation incorporated," and "potentially significant."

Impacts identified in the Initial Study as potentially significant unless mitigated, less-than-significant, or nonexistent are presented below. All remaining issues identified in the Initial Study as potentially significant are discussed in the subsequent technical chapters of this Draft EIR.

- *Agricultural Resources (a-c.):* The Initial Study found that the project would have a significant impact to prime agricultural lands. According to the General Plan Update EIR, buildout of the General Plan area would result in urban development of prime agricultural lands, which is considered a significant impact. The Brentwood City Council adopted Findings of Fact and a Statement of Overriding Considerations for the significant and unavoidable impacts associated with the General Plan buildout. The proposed project could not result in greater impacts to farmland than was previously evaluated in the General Plan Update EIR.

Therefore, buildout of the proposed project, including conversion of agricultural land to urban uses, would not result in adverse impacts to farmland. The Initial Study also notes that the City requires mitigation by any applicant for a subdivision that will permanently change agricultural land over one acre in size to any nonagricultural use. The agricultural mitigation program requires the applicant to either grant a farmland conservation easement or farmland deed restriction to the City and/or a "qualifying entity" approved by the City, on a one-to-one land area ratio, or pay an in-lieu fee based on a formula for a one-to-one land area ratio and established by City Council resolution. The project site is not under Williamson Act contract, and the area is currently zoned for commercial, residential, and other uses. Therefore, future development of the area with retail, residential, and other uses would not conflict with a Williamson Act contract or existing zoning for agriculture; thus resulting in a less-than-significant impact to agricultural resources.

- *Biological Resources (c.):* The Initial Study found that the project site would not have an adverse affect on any protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Therefore, no impact would occur. However, impacts to jurisdictional waters are addressed in the Biological Resources chapter of this EIR.

- *Geology and Soils (aiv., b-e.):* The Initial Study found that the project could have potential impacts related to erosion and the presence of expansive soils; however, implementation of the mitigation measures identified for these impacts would reduce the project's impacts related to geology and soils to a less-than-significant level. In addition, the Initial Study indicates that because the proposed project area is essentially flat, the area is not susceptible to landslides. Furthermore, the project is expected to connect to existing City sewer systems; therefore, the project would have no impact on soils that support the use of septic tanks or alternative wastewater disposal systems.

  The following mitigation measures would reduce impacts related to erosion and the presence of expansive soils to a less-than-significant level.

  VI-1. Prior to the issuance of grading permits, the project applicant shall submit, for the review and approval of the City Engineer, an erosion control plan that utilizes Best Management Practices (BMPs) to limit the erosion effects during construction of the proposed project. Measures could include, but are not limited to:

  - *Hydro-seeding;*
  - *Placement of erosion control measures within drainageways and ahead of drop inlets;*
  - *The temporary lining (during construction activities) of drop inlets with "filter fabric" (a specific type of geotextile fabric);*

- *The placement of straw wattles along slope contours and back-of-curb prior to installation of landscaping;*
- *Directing subcontractors to a single designation "wash-out" location (as opposed to allowing them to wash-out in any location they desire);*
- *The use of siltation fences; and*
- *The use of sediment basins and dust palliatives.*

VI-2. Prior to the approval of Improvement Plans and building permits, the project proponent shall submit a design-level geotechnical study to the City Engineer for review and approval, which specifically addresses whether expansive soils or soils prone to liquefaction are present in the development area, and includes measures to address these soils where they occur. All grading and foundation plans designed by the project Civil and Structural Engineer must be reviewed and approved by the City Engineer and Chief Building Official prior to issuance of grading and building permits to ensure that all geotechnical recommendations specified in the geotechnical report are properly incorporated and utilized in design. In addition, the applicant of the proposed project shall comply with UBC standards.

VI-3. Implement Mitigation Measure VI-2.

- *Hazards (d-f.):* The project site has not been identified on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. In addition, the proposed project site is not within an airport land use plan or within two miles of an airport. Therefore, no impact would occur.

- *Hydrology and Water Quality (a-j.):* The Initial Study found that the project site could have potential impacts to water quality within the City of Brentwood; however, implementation of the mitigation measures identified for this impact would reduce the impact to a less-than-significant level. In addition, future construction and development projects within the project area would be subject to further project-specific review to address water quality concerns. The General Plan EIR includes mitigation measures to reduce impacts to groundwater supplies and recharge to a less-than-significant level. Therefore, buildout of the proposed project site is consistent with the General Plan and would have a less-than-significant impact on groundwater recharge. The project would result in an increase in stormwater runoff rates and would require infrastructure improvements within the project site. However, implementation of the mitigation measures identified for this impact would reduce the impact to a less-than-significant level. The project site is not within the 100-year floodplain, therefore, buildout of the proposed project would not place structures that would impede or redirect flood flows and would not expose people or structures to a significant risk of loss, injury, or death involving flooding. The project area is not located within

an area subject to damage by seiche, tsunami, or mudflow. Therefore, implementation of the proposed project would not result in impacts relating to these phenomena.

Implementation of the following mitigation measures would reduce impacts to a less-than-significant level for water quality and drainage.

VIII-4. Prior to the issuance of grading permits, the project applicant shall obtain and comply with the NPDES General Construction Permit, including the submittal of a Notice of Intent (NOI) and associated fee to the SWRCB, and the preparation of a Storm Water Pollution Prevention Plan (SWPPP) for review and approval of the City Engineer. The SWPPP shall serve as the framework for identification, assignment, and implementation of Best Management Practices (BMPs). The developer shall implement BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable. The SWPPP shall be submitted to the City Engineer for review and approval and shall remain on the project site during all phases of construction. Following implementation of the SWPPP, the developer shall subsequently demonstrate the SWPPP's effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in stormwater discharges to the maximum extent practicable.

VIII-5. Prior to the issuance of building permits, the design of drainage facilities for the project shall meet with the approval of both the City Engineer and the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD).

VIII-6. Prior to the issuance of building permits, the project applicant shall pay CCCFCWCD drainage fees for the project site.

- *Land Use (a.):* The proposed project area is generally developed with residential, commercial, industrial, and public facility uses. Communities in the Brentwood Boulevard Specific Plan area are already established, and buildout of the proposed project would not divide these communities, as most of the site-specific projects would be redevelopment or infill projects. Therefore, the proposed project would result in no impact to an established community.

- *Mineral Resources (a, b.):* The 2001 Brentwood General Plan EIR does not identify any mineral resources in the project area (with the exception of natural gas resources discussed in Chapter 4.8, Hazards). Therefore, the proposed project would have no impact to mineral resources.

- *Noise (e, f.):* The proposed project site is not located near an existing airport and is not within an area covered by an existing airport land use plan. Therefore, the

proposed project would not have any impact related to excessive noise levels from a public airport or private airstrip.

- *Population and Housing (b, c):* The Initial Study found that the project site is not anticipated to cause any displacement of housing or persons within the project area. Therefore, the project would not have any impact on the displacement due to development of the proposed project site.

- *Transportation and Circulation (c.):* The project site would not require any changes to existing regional air traffic activity and the project area is not located near an airport. Therefore, the project would not have any impact on air traffic patterns.

Issues Addressed in this Draft EIR

The Initial Study identified several environmental impacts as potentially significant that required further analysis. This EIR provides the additional analysis necessary to address the technical environmental impacts not fully resolved in the Initial Study. Consistent with the conclusions of the Initial Study, the following environmental issues are addressed in this Draft EIR:

- Land Use;
- Aesthetics;
- Transportation and Circulation;
- Air Quality and Climate Change;
- Noise;
- Biological Resources;
- Cultural Resources;
- Hazards; and
- Public Services and Utilities (including impacts to recreational facilities).

Technical Chapter Format

Each technical chapter begins with an **introduction** describing the purpose of the chapter. The introduction is followed by a description of the project's **environmental setting** pertaining to that particular issue. The setting description is followed by the **regulatory context** and the **impacts and mitigation measures** discussion. The mitigation measure discussion contains the **significance criteria**, followed by the **methods of analysis**. The **impact and mitigation** discussion includes impact statements prefaced by a number in bold-faced type. An explanation of each impact and an analysis of the impact's significance follow each impact statement. All mitigation measures pertinent to each individual impact follow directly after the impact statement (see below). The degree of relief provided by identified mitigation measures is also evaluated. An example of the format is shown below:

4.x-1 Statement of impact.

Discussion of impact for the proposed project in paragraph format.

Statement of ***level of significance*** of impact prior to mitigation is included at the end of each impact discussion.

<u>Mitigation Measure(s)</u>
Statement of *level of significance* after the mitigation is included immediately preceding mitigation measures.

4.x-1(a) *Required mitigation measure(s) presented in italics and labeled in consecutive order.*

4.x-1(b) *etc.*

4.1 LAND USE

4.1 LAND USE

Introduction

The purpose of the Land Use chapter is to examine the compatibility of the Sciortino Ranch project (proposed project) with existing and planned land uses in the area, as well as the proposed project's consistency with applicable goals and policies. Documents referenced to prepare the Land Use chapter include the *City of Brentwood General Plan Update*,[1] the *City of Brentwood General Plan Update EIR*,[2] the *City of Brentwood Municipal Code,*[3] and the *Draft Sciortino Ranch Design Guidelines*.[4]

Existing Environmental Setting

CEQA Guidelines Section 15125 states, "[…] an EIR must include a description of the physical environmental conditions in the vicinity of the project […] and shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans." The following section provides the existing surrounding land uses in the vicinity of the proposed project site, as well as the existing and proposed land use and zoning designations for the project site.

Local Setting

The project site primarily consists of vacant land. However, a natural gas well exists in the northeastern portion of the site, and near the western boundary, evidence of a former agricultural residence with associated buildings exists, as well as an inactive water well. The site has been disked several times for agricultural uses. The project site is currently surrounded by existing single-family residential uses to the north, residences and commercial retail buildings to the south, developed residential lots to the east, and commercial uses across Brentwood Boulevard to the west. One vacant parcel of land is located adjacent to the northwest boundary of the project site and two additional vacant parcels are located across Brentwood Boulevard to the southwest of the site.

It should be noted that the proposed project site is located within the North Brentwood Redevelopment Area. According to the Brentwood General Plan, the North Brentwood Redevelopment Area has been identified as a blighted area of mixed commercial and residential uses. Designation as a Redevelopment Area allows for special steps to be taken to encourage new development and rehabilitation of existing uses within the area.

Existing and Proposed Land Use Designations

Existing Land Use Designations

According to the City of Brentwood General Plan, the land use designations for the proposed project site include Mixed-Use Business Park (BP) and Very High Density Residential (VHDR).

The Brentwood General Plan includes the following definitions for these land use designations:

Mixed-Use Business Park (BP)

The BP category is intended to provide for integrated subclusters of business and research parks, large individual corporate establishments, and professional and administrative office or light industrial complexes. Selected complementary commercial activities or limited residential uses may be allowed. Examples of allowed uses in the BP category include computer software companies, medical supply companies, research laboratories, copying services, title companies, printing companies, warehousing, offices, cabinet makers, auto services, equipment repair, wholesale home furnishings, light manufacturing, retail commercial services, retail uses, convenience stores, restaurants, wineries (and associated orchards, row crops, production facilities, packing and shipping facilities, amphitheatre and related uses, catering facilities, and restaurants), multi-family housing units, senior apartments, and institutional levels of congregate care.

Very High Density Residential (VHDR)

The VHDR category (20.1 to 30.0 dwelling units per acre [du/ac]) is intended to expand housing choices and provide for convenient living options immediately adjacent to employment, services, and public amenities. The VHDR designation allows for seven acres of attached dwelling units and residential amenities near commercial services and employment opportunities, and is intended to provide a well-designed transition between lower density residential areas and non-residential uses near the Brentwood Boulevard corridor.

In addition to the above land use designations, the project site is located within Special Planning Area A (SPA A). The Brentwood General Plan includes the following description of the SPA A designation:

Special Planning Area A

This special planning area, approximately 67 acres in size, is bounded by the existing Havenwood single family subdivision on the north, approved mixed use development of retail commercial and medium density residential on the south, State Route (SR) 4 on the west and vacant, formerly agricultural land on the east that is planned for low density residential. Future plans call for the planning area to be bisected by the easterly extension of Sand Creek Road to Sellers Avenue. Several factors that provide the guiding focus for a future policy direction for the development of this SPA include: Brentwood Center across SR 4 to the west, the area's

proximity to downtown Brentwood, and the existence of commercial uses to the west and south of the area.

The policy direction for SPA A is to provide a mixed use business park or retail development along with very high density residential development consisting of primarily professional office, and/or retail commercial, limited light industrial uses with complementary commercial services, and multi-story multi-family housing in close proximity to complementary commercial services and employment opportunities. The intent of the office, retail, multi-family residential land uses and related commercial services is to take advantage of the SR 4 and Sand Creek Road frontages, integrate complementary commercial and residential uses, and ensure that new development shall complement the existing Brentwood Center commercial and office developments along the west side of SR 4. The light industrial uses shall be separated from nearby developed or approved residential uses and the very high density residential uses planned within this SPA, through wide densely landscaped buffers and on-site roadway corridors.

The suggested mix of Business Park land uses is as follows:

- Very High Density Residential – 7 acres;
- General Commercial – 13 acres; and
- Business Park – 47 acres.

The following design objectives for SPA A are included in the Brentwood General Plan:

- Develop a coordinated circulation system that provides access to the various land uses from Sand Creek Road with minimal or no driveways opening directly onto State Route 4;
- Include a median landscaped buffer in the design of the Sand Creek Road extension;
- Design the light industrial uses as a campus setting with coordinated architecture, lush landscaping around building perimeters, within street medians / traffic circles, courtyards, and parking areas to ensure compatibility with the existing/approved residential land uses to the north and south;
- Design the multi-family residential uses to provide a range of unit sizes, buffered from Brentwood Boulevard and Sand Creek Road, with extensive residential amenities and architectural features that provide opportunities for socializing and promote an active and less auto-dependent lifestyle in close proximity to jobs and complementary commercial services;
- Design the Business Park with significant high quality design amenities and a distinct architectural theme; and
- Design and orient buildings greater than two stories high in a manner that minimizes obstruction of scenic views of Mt. Diablo and the foothills west of the City.

Proposed Land Use Designations

The SPA-A would be modified to recognize the available mix of potential land uses identified in the PD-55 zone. These land uses include the following: Very High, High, and Medium Density Residential uses; Commercial uses, including retail, office, and institutional uses; and park uses.

Table 4.1-1 includes a scenario of land uses acceptable under the proposed PD-55 zoning matrix by sub-area.

Table 4.1-1
Land Use for the Proposed Project

Sub Areas	Acreage	Fixed Park Acreage	# of MFD Apartment (du)	# of SFH Detached (du)	Retail (s.f.)	Office (s.f.)	Institutional (s.f.)
Sub-Area # 1	9.4	-	-	-	47,372	87,991	-
Sub-Area # 2A	5.5	-	-	-	59,895	-	-
Sub-Area # 2B	10.5	-	-	-	-	-	228,690
Sub-Area # 3A	3.4	-	-	27	-	-	-
Sub-Area # 3B	3.3	-	-	40	-	-	-
Sub-Area # 4	10.1	-	303	-	-	-	-
Sub-Area # 5A	4.6	4.6	-	-	-	-	-
Sub-Area # 5B	0.5	0.5	-	-	-	-	-
Sub-Area # 6	5.5	-	165	-	-	-	-
Sub-Area # 7A	3.8	-	-	30	-	-	-
Sub-Area # 7B	3.6	-	-	43	-	-	-
TOTALS:	**60.2**	**5.1**	**468**	**140**	**107,267**	**87,991**	**228,690**

Note: The following are the assumed densities for each proposed residential sub-area: 3A = 8 du/ac, 3B = 12 du/ac, 4 = 30 du/ac, 6 = 30 du/ac, 7A = 8 du/ac, 7B = 12 du/ac. The following are the assumed floor-to-area ratios (FAR) for the non-residential uses: Retail = 25%, Office = 40%, Institutional = 50%).

du = Dwelling Units
s.f. = Square Feet
MFD = Multi-Family Dwellings
SFH = Single-Family Housing

Surrounding Land Use Designations

The surrounding General Plan land use designations include General Commercial (GC), Medium Density Residential (MDR), and Low Density Residential (LDR). The GC designation is located to the south and west of the site, the MDR designation is located to the north and south of the site, and the LDR designation is located to the east of the site.

The Brentwood General Plan includes the following definitions for the GC, MDR, and LDR designations:

General Commercial (GC)

The General Commercial category allows for concentrations of a variety of mixed commercial uses and service-type businesses to serve specific areas of the City and neighborhoods that are related to State Route (SR) 4 and some arterial intersections, on parcels generally ranging from one to 20 acres. Such uses do not lend themselves to being located in regional commercial centers, but are encouraged in orderly clusters in suitable locations adjacent to the highway and major arterials. Depending upon the size of the center, a single major tenant (e.g., supermarket or small department store) or a single small tenant (e.g., convenience store) should provide the anchor. As a secondary use, independent small businesses (e.g., hair salons, shoe repair, sit-down restaurants) will also be allowed. Examples of uses include convenience stores, fast serve eating establishments, auto repair, gas stations, and offices.

Low Density Residential (LDR)

The LDR category (1.1 to 5.0 du/ac) is designed predominantly for single-family detached houses, although occasional higher density single-family patio houses or zero lot line houses could be accommodated if offset with sufficient open space to maintain the gross density within the indicated range or if specific criteria can be met. Development in the LDR category generally results in 6,000 to 8,000 square foot lots.

Medium Density Residential (MDR)

The MDR category (5.1 to 11.0 du/ac) is designed predominantly for development of duplexes and fourplexes, as well as small apartment buildings and townhouses, although small lot detached single-family development could be included.

Existing and Proposed Zoning Designations

The current zoning designation for the project site is Planned Development (PD)-55. The project would retain the existing zoning designation, but would include approval of an amendment to the PD-55 zone in order to divide the project area into 11 zoning sub-areas and provide applicable development standards for each sub-area (See Figure 4.1-1). Permitted and Conditionally Permitted land uses are described for each zoning sub-area per a Zoning Matrix that is a component of the PD-55 zone (See Table 4.1-2).

The zoning matrix describes the regulated uses for the mixed-use PD-55 zone. The PD-55 zone is inclusive of the matrix and the associated *Draft Sciortino Ranch Design Guidelines* that would be approved in conjunction with the project. The *Draft Sciortino Ranch Design Guidelines* define acceptable site planning and architectural design elements (e.g., setbacks, building heights) and address transitions between commercial and residential land uses.

Figure 4.1-1
PD 55 Zoning Development Subarea Map

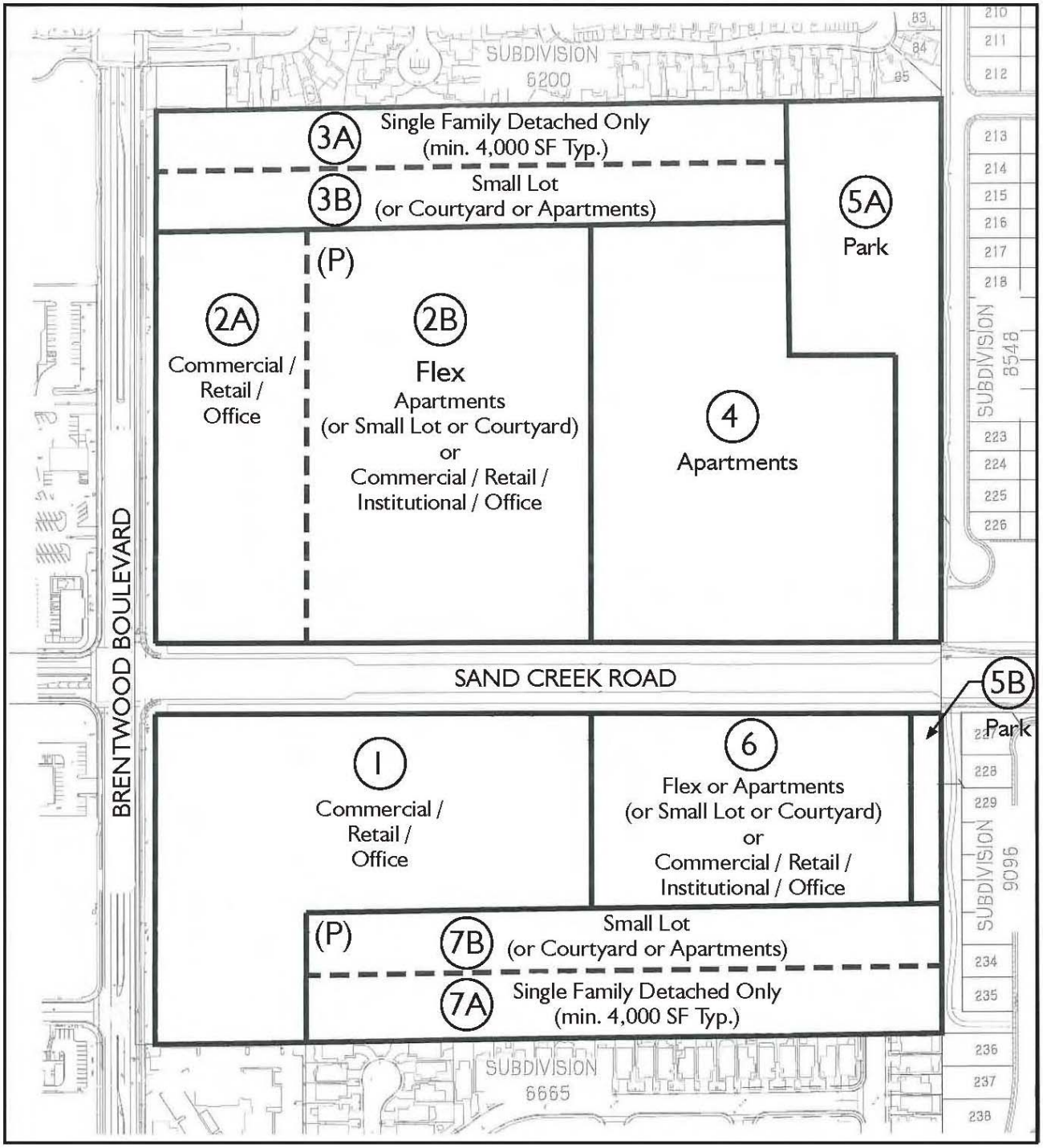


Table 4.1-2
PD-55 Zoning Matrix of Land Uses by Sub-Area

	Commercial Emphasis		Flex Com. & Res.	Residential Emphasis			Park Emphasis		Flex Com. & Res.	Residential Emphasis	
LAND USES[1]	**1**	**2A**	**2B**	**3A**	**3B**	**4**	**5A**	**5B**	**6**	**7A**	**7B**
Commercial Uses											
Merchandise and/or General Retail Sales Greater than 75,000 s.f. for any Single User Building [2] (Applies only to One Single-User Building located either north or south of Sand Creek Rd.; see below for any Second Building or more)	■	■	■						■		
Merchandise and/or General Retail Sales Less than 75,000 s.f. (Applies to any Single-User or Multi-Tenant Building)	■	■	■						■		
Supermarkets or Grocery (with Beer, Wine, and Distilled Spirits sales)	■	■	■						■		
Convenience Store (with or without Beer & Wine sales)	■	■	■						■		
Pharmacy Establishments with or without Drive-through	■	■	■						■		
Gas Stations, with or without Car Wash and/or Convenience Store	■	■	■						■		
Pet and Pet Supply Stores[3]	■	■	■						■		
Restaurants[4] (with or without Beer & Wine sales)	■	■	■						■		
Convenience Restaurants with or without drive-thru service[5]	■	■	■						■		

1 PD-55 Zoning expressly does not include any mid-range density policy or requirements, physical design is to adhere to the PD-55 Municipal Ordinance and the adopted Sciortino Ranch Design Guidelines, sub-areas are specifically designed to respond to any existing adjacent development by incorporating like densities, uses, or park buffers.

2 When calculating Square Footages for a proposed project, the noted 75,000 s.f. does not include first or second floor business office, personnel, stock room, or loading areas.

3 Including on-site Veterinary Clinics, excluding boarding of pets for more than 5 days.

4 Including by way of example but not limited to full-service sit-down restaurant establishments.

5 Including by way of example but not limited to Sandwich Shops or Fast-Food establishments.

Table 4.1-2
PD-55 Zoning Matrix of Land Uses by Sub-Area

	Commercial Emphasis		Flex Com. & Res.	Residential Emphasis			Park Emphasis		Flex Com. & Res.	Residential Emphasis	
LAND USES[1]	**1**	**2A**	**2B**	**3A**	**3B**	**4**	**5A**	**5B**	**6**	**7A**	**7B**
Specialty Merchandise and Convenience Sales[6]	■	■	■						■		
Video Arcades, indoor Movie Theatre, Bowling Alley, Skating Rink, and similar entertainment establishments	■	■	■						■		
Temporary parking lot display and/or sale areas[7]	■	■	■						■		
Outdoor display, dining, and/or sale of merchandise[8]	■	■	■						■		
Commercial services[9]	■	■	■						■		
Commercial uses which may or may not manufacture their primary product on the premises[10]	■	■	■						■		
Business, Institutional, Administrative, Financial, and Professional Offices[11]	■	■	■						■		
Research and development facilities[12]	■	■	■						■		

6 Including by way of example but not limited to Specialty Foods, Delicatessen, Bakery, Pastry, Candy, Ice Cream, Butcher, Meat Market, Wine, Tobacco, Apparel, Jewelry, Cosmetics, Stationery, Shoes & Shoe Repair, Kitchenware, Motor Vehicle Parts, Hobby, specialty interest stores, and similar establishments.

7 Requires approval of a Temporary Use Permit per BMC Chapter 17.850.

8 If outdoor display, dining, and/or sales areas are proposed post formal design review and/or development of a subject building then either: 1) BMC Section 17.900.009 shall apply for uses proposed on private property, or 2) BMC Section 17.900.005 shall apply for uses proposed in the public right of way (excluding any Down Town zone specific regulations).

9 Including by way of example but not limited to Barbershop, Beauty Shop, Hair Salon, Laundry, Dry Cleaning, Laundromat, Electronic, Appliance Sales and Repair, Watch and Clock Repair, Health Club, Recreation Club, Weight Loss, Tanning Studio, Small Equipment Rental and Repair, Real Estate Sales and Rental, Title and Escrow Services, Architectural, Engineering, Legal and Accounting Services, Insurance Agency, Employment Agency, Outpatient Medical, Dental and Optical Services, Technology Access Center, Telecommuting Center, Addressing, Post Box and Mailing Service, Blueprinting, Photostating and Desktop Publishing & Printing Services, Drafting Service, Messenger Service, Stenographic Service, Answering Service, Private Postal Box Service, Travel Agency, Bank Branch, ATM facility, and similar establishments.

10 Including but not limited to Drapery or Upholstery Shop and similar establishments.

11 Including but not limited to large-scale single and/or multi-tenant office uses, such as Trade Schools, Colleges, Public and Quasi-Public Offices, Library, Post Office and Utility Office.

12 Including by way of example but not limited to research, office, support and associated warehouse areas.

Table 4.1-2
PD-55 Zoning Matrix of Land Uses by Sub-Area

	Commercial Emphasis		Flex Com. & Res.	Residential Emphasis			Park Emphasis		Flex Com. & Res.	Residential Emphasis	
LAND USES[1]	**1**	**2A**	**2B**	**3A**	**3B**	**4**	**5A**	**5B**	**6**	**7A**	**7B**
Wholesale showrooms and distribution centers	■	■	■						■		
Hotel	■	■	■						■		
Self-service storage facilities[13]	◘	◘	■						■		
Light industrial uses which generate minimal noise, odor, smoke, and waste material[14]	◘	◘	■						■		
Merchandise and/or General Retail Sales Greater than 75,000 s.f. for any Single User Building [15] (Applies to any Second Single-User Building, or more, located either north or south of Sand Creek Rd.)	◘	◘	◘						◘		
Sports bar, lounge, nightclub and similar establishments[16]	◘	◘	◘						◘		
Liquor Stores[17]	◘	◘	◘						◘		
Motor Vehicle Sales[18]	◘	◘	◘						◘		
Construction contractor's and contractor related services and affiliated storage[19]	◘	◘	◘						◘		

13 Mini-storage or warehouse with or without a resident manager's dwelling unit.

14 Including by way of example, but not limited to, Warehouses, Controlled Manufacturing and Assembly, Printing or Lithography Production establishments, Plastic Fabrication, Electronic and Electrical Product and Instrument Manufacturing, Garment Manufacturing, Furniture Making, Upholstering, Food Processing and similar uses.

15 When calculating Square Footages for a proposed project, the noted 75,000 s.f. does not include first or second floor business office, personnel, stock room, or loading areas.

16 With on-site sale of beer, wine, and distilled spirits, including establishments which offer food, entertainment and/or dancing.

17 Liquor Stores including by way of example, but not limited to, establishments that sell primarily beer, wine, and distilled spirits.

18 Including Automobile, Motorcycle, Recreational Vehicle and Boat Sales, and similar establishments.

19 Including but not limited to cabinetry, countertop, and sheet metal fabrication shops.

Table 4.1-2
PD-55 Zoning Matrix of Land Uses by Sub-Area

	Commercial Emphasis		Flex Com. & Res.	Residential Emphasis			Park Emphasis		Flex Com. & Res.	Residential Emphasis	
LAND USES[1]	**1**	**2A**	**2B**	**3A**	**3B**	**4**	**5A**	**5B**	**6**	**7A**	**7B**
Residential Uses[20]											
Single Family Detached Homes (Min. Lot Size: 4,000 s.f.)			■	■	■				■	■	■
Small Lot Single Family Homes (Min. Lot Size: 2,100 s.f.)[21]			■		■				■		■
Courtyard Detached Homes – 4 units or fewer (Min. Lot Size: 2,500 s.f.)			■		■				■		■
Courtyard Detached Homes – 7 units max (Min. Lot Size: 2,500 s.f.)			■		■				■		■
Duet Homes (2 Attached Units, Min. Lot Size per Unit: 2,400 s.f.)			■		■				■		■
Apartments and Condominiums[22]			■		■	■			■		■
Park Uses [23]											
Parks							■	■			

Symbol Legend
■ = Permitted Use [24]
◘ = Conditional Use Permit Required [25]

[20] Keeping of domestic animals or pets subject to BMC Chapter 17.670.

[21] See the adopted Sciortino Ranch Design Guidelines for lot sizes associated with zipper lots and alley load lots.

[22] Multi-family structures shall not exceed thirty (30) dwelling units per gross acre. Permitted uses include accessory uses and facilities related to the primary use including on-site manager quarters, leasing or sales offices, site maintenance areas, carports, recreation buildings and fitness facilities for use by residents and their guests. Signs are subject to BMC Chapter 17.640.

[23] Parkland areas are subject to park size minimums described within the adopted Sciortino Ranch Design Guidelines. Park credits are also described in the Design Guidelines. Parks are allowed in all Sub Areas per the Guidelines with specified Park areas located in Sub Area 5A and 5B. Park sub area borders are flexible to accommodate future development designs that better integrate park land use edges.

[24] All proposed developments are to be consistent with the adopted Sciortino Ranch Design Guidelines, as applicable, for each permitted land use. Land uses that are similar in nature and operation to those uses identified within the land use matrix are acceptable subject to approval by the Community Development Director. The decision of the Community Development Director is subject to appeal in accordance with Brentwood Municipal Code (BMC) Chapter 17.880.

[25] Symbol notes uses that are required to undergo a conditional use permit process (per BMC Chapter 17.830).

Surrounding Zoning Designations

The zoning designations surrounding the project site include Neighborhood Commercial (C-1), General Commercial (C-2), Commercial/Office/Business (COB), Moderate Density Multi-Residential (R-2), Planned Development (PD)-42, and Planned Development (PD)-46. The C-1 zoning designation is located to the south of the site, the C-2 and COB zoning designations are located to the west, the R-2 zoning designation is located to the north and south, the PD-42 designation is located to the southwest, and the PD-46 designation is located to the east. It should be noted that the majority of the surrounding lands have already been built out according to these zoning designations, including the Barrington Neighborhood located east of the project site, the Havenwood Neighborhood located north of the project site, and another residential subdivision located south of the project site.

Regulatory Context

Local Regulations

The following are the local government environmental goals and policies relevant to the CEQA review process.

City of Brentwood General Plan

The following are applicable General Plan goals and policies from the General Plan's Land Use Element:

Goal 1 A diverse, self-sufficient community that offers a broad spectrum of job opportunities, housing types, community facilities and commercial services.

- Policy 1.1 City Development Control: Maintain responsible City control of development within the Planning Area.
- Policy 1.2 Balanced Neighborhoods: Promote neighborhoods that provide a balanced mix of land uses and development types.
- Policy 1.3 Community Design: Ensure that new development is designed to promote convenient, comfortable, and safe pedestrian services.

Goal 2 A high quality residential environment that positively contributes to the special, small town atmosphere of Brentwood.

- Policy 2.1 Compatible Neighborhoods: Promote compatibility between and within new and existing neighborhoods.
- Policy 2.2 Residential Mix: Maintain Brentwood's predominant land use of single-family residential, while providing for a mix of housing types and affordability levels throughout the community.

Goal 3 A diversified mix of strong retail centers, service commercial activities, manufacturing enterprises and high-paying employment opportunities that contribute to Brentwood's economic well being.

Policy 3.1 Downtown Focus: Maintain the Downtown as the community's dominant commercial, civic and cultural center.

Policy 3.2 Regional Commercial (Retail): Establish inviting and attractive regional commercial centers that are exceptionally well designed.

Policy 3.3 Existing Retail Centers: Strongly encourage rehabilitation and redevelopment of existing shopping centers at those locations where a dominant retail use is still likely to be viable. Encourage conversion to non-retail uses at those locations with obsolete retail space, limited opportunity for future viable retail uses, or both.

Policy 3.4 Superior Commercial Design: Strongly encourage exceptionally high quality, innovative and unique new commercial development throughout the City that meets the existing and future needs of Brentwood residents and visitors.

Goal 4 A variety of employment opportunities in Brentwood provided by adequate areas for industrial, commercial, and office land use.

Policy 4.1 Minimize Impacts: Minimize and mitigate industrial development impacts on adjacent land.

Policy 4.2 Small Scale Office/Industry: Allow for small-scale office and industrial uses within the Planning Area.

Policy 4.3 Office Campuses, Business Parks, Industrial Parks: Encourage the location of high quality, professional office campuses, business parks, and industrial parks along with related mixed-use development, where appropriate within the City.

Policy 4.4 Medium Industrial Uses: Set aside sufficient land in the northeast area of Brentwood for intensive industrial uses to retain and attract a diverse mix of industrial enterprises and expand available employment opportunities.

Goal 5 A high quality natural environment in Brentwood.

Policy 5.1 Habitat Areas: Protect selected significant habitat areas for their ecological, educational, scenic and recreational values.

Policy 5.2 Other Environmental Features: Protect those environmental features that make Brentwood an attractive and desirable place to live, work and visit.

In addition, the following are applicable General Plan goals and policies from the General Plan's Community Design and Growth Management Elements:

Community Design Element

Goal 1 Promote the highest standards of architecture and site design for all development projects, both public and private.

Policy 1.2 Well-Defined Neighborhoods: Residential neighborhoods should be well-defined with park and recreation facilities, schools, open space, and neighborhood commercial land uses that incorporate unifying landscape and architectural themes.

Policy 1.3 Quality Landscaping and Design: Encourage quality landscape and design.

Growth Management Element

Policy 1.3 Park Planning: A variety of park facilities shall be provided in a timely manner in accordance with the pace of development as per the *Parks, Trails, and Recreation Master Plan*.

Policy 1.6 Growth Management: The City will require provision of concurrent infrastructure to address the impacts of development projects.

Impacts and Mitigation Measures

Standards of Significance

For the purposes of this Draft EIR, impacts are considered significant if implementation of the proposed project would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or
- Result in a land use that is inconsistent with existing City plans and/or policies.

Method of Analysis

The Land Use chapter analyzes the compatibility of the proposed project with surrounding land uses and the consistency of the proposed project with adopted plans and policies. Environmental

impacts resulting from the proposed project are discussed in the respective environmental categories. This chapter differs from the analyses in Chapters 4.2 through 4.9 in that plan consistencies and land use compatibilities are addressed instead of environmental impacts. This discussion complies with Section 15125(d) of the CEQA Guidelines, which requires that EIRs discuss inconsistencies to local plans as part of the environmental setting.

Compatibility with Existing Uses

The proposed project is evaluated for compatibility with the existing land uses adjacent to the project site. The evaluation considers the existing and planned type and intensity of uses in the project vicinity and those proposed for the project site. The analysis assumes the construction and implementation of the proposed project within the existing and planned environment to determine if the project is compatible with those existing and planned uses surrounding the project site.

Consistency with the General Plan

The proposed project is examined for potential inconsistencies between the proposed project and the General Plan, based on the goals and policies of the General Plan. Mitigation measures are not identified for any stated inconsistencies; however, any inconsistencies may be considered in the determination of physical environmental impacts identified in Chapters 4.2 through 4.9. The determination of consistency ultimately rests with the City Council.

Consistency with the Zoning Ordinance

The proposed project is examined for potential inconsistencies between the proposed project and the adopted zoning designations of the site. Mitigation measures are not identified for any stated inconsistencies; however, any inconsistencies may be considered in the determination of physical environmental impacts identified in Chapters 4.2 through 4.9. The determination of consistency ultimately rests with the City Council.

Project-Specific Impacts and Mitigation Measures

4.1-1 Compatibility with existing or planned surrounding land uses.

The determination of compatibility of land uses typically relies on a general discussion of the types of adjacent uses to a proposed project and whether any sensitive receptors exist either on the adjacent properties or associated with the proposed project. Incompatibilities typically exist when uses such as residences, parks, churches, and schools are located adjacent to more disruptive uses, such as heavy industrial, major transportation corridors, and regional commercial centers, where noise and traffic levels may be high. The identification of incompatible uses occurs if one land use is anticipated to be disruptive of the existing or planned use of an adjacent property.

The proposed project may include single-family and multi-family residential development, commercial/retail/office uses, a community college (institutional use), and

a minimum of two park sites, as well as the infrastructure improvements necessary to accommodate the new development. The single-family areas of the proposed project would have densities that range from 7.9 to 12.1 dwelling units per acre (du/ac) and the two multi-family areas of the proposed project would each have a density of 30.0 du/ac. The residential areas surrounding the project site are designated Low Density Residential (LDR) to the east and Medium Density Residential (MDR) to the north and south. The LDR designation allows for a density range of 1.1 – 5.0 dwelling units per gross acre (du/ac) and the MDR designation allows for a density range of 5.1 - 11.0 du/ac. Although the proposed densities are greater than most of the surrounding residential uses, the proposed residential density ranges are consistent with the densities specified in the General Plan, with the single-family residential areas having lower densities than specified in the General Plan. It should be noted that the northeastern and southeastern portions of the project site would be developed with single-family detached uses, which would provide transitions to the existing adjacent Medium-Density Residential uses that border the project site to the north and south. The portion of the project site that borders the existing Low Density Residential uses to the east would be developed with park uses, which would also provide a transition to the residential uses.

Approval of the proposed project would result in the construction of a mixed-use development that includes residential, commercial/retail/office, institutional, and park uses where Very High Density Residential and Mixed-Use Business Park uses are currently planned. The project would be consistent with surrounding land uses, including the Barrington Neighborhood located east of the project site, the Havenwood Neighborhood located north of the project site, and another residential subdivision located south of the project site. The proposed project is anticipated to be compatible with surrounding uses, as the commercial/retail/office portions of the project would front Brentwood Boulevard, where adjacent commercial uses currently exist, and the residential uses would be adjacent to existing residential uses.

Development of the project would locate single-family and multi-family residential uses adjacent to a park in the northeastern portion of the project site. The park would be located near an existing gas well. Prior to implementation of the proposed project, the gas well will be properly abandoned and the potentially contaminated soils will be remediated. Development will not be allowed on this portion of the site until a federal or State authorized agency provides a “No Further Action Required” letter to the project applicant (See Chapter 4.8, Hazards, Impact 4.8-2 for further detail). For the site to be used as a park, limitations cannot be placed on the property, based on the property’s current development with a gas well.

It should be noted that, according to the PD-55 Zoning Matrix of Land Uses by Sub-Area (See Table 4.1-2), which includes all of the uses that could potentially be permitted within the PD-55 Zone, certain permitted retail uses are allowed adjacent to residential (such as businesses that sell alcohol, fast food drive-thrus, or other uses that may have extended hours of operation) which may require additional security measures.

The project is anticipated to be compatible with surrounding land uses and physical environmental impacts such as impacts related to noise, air quality, and traffic that would arise from development of the proposed project are assessed in other chapters of the EIR (See Chapter 4.3, Transportation and Circulation; Chapter 4.4, Air Quality; and Chapter 4.5, Noise for further analysis of these issues). However, because the project could locate certain retail uses that may require additional security measures, impacts related to the project could be ***potentially significant***.

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

4.1-1 *Prior to the approval of any permitted use involving the sale of alcohol as the primary means of business (i.e., convenience markets, bars, nightclubs, liquor stores, etc.), drive-thrus, or hours of operation beyond 10:00 pm, the applicant shall be required to prepare a plan detailing the operational and security-related characteristics of the proposed use. Said plan shall be submitted for the review and approval of the Community Development Director and the Chief of Police, and shall be incorporated into the respective design review or tenant improvement permit approval.*

4.1-2 Consistency with adopted General Plan designations and policies.

The project site's existing General Plan land use designations include Mixed-Use Business Park and Very High Density Residential; therefore, approval of the proposed project would require the Brentwood City Council to amend the existing land use designations, resulting in a General Plan Amendment to change approximately 58 acres of Mixed Use Business Park (BP) and seven acres of Very High Density Residential (VHDR) to an approved mix of land uses included in the proposed PD-55 zone. In addition, because the proposed project site is located within Special Planning Area A, relevant General Plan text would be modified to reflect the proposed amendment to the Special Planning Area (SPA-A) description. Furthermore, the General Plan Land Use Map would be amended to reflect the SPA-A designation.

The City of Brentwood General Plan Land Use Map (Figure 3 of the Brentwood General Plan) designates the following land uses for the proposed project site:

- Mixed Use Business Park (BP); and
- Very High Density Residential (VHDR) (20.1 to 30.0 du/ac).

The proposed project may include single-family and multi-family residential development, commercial/retail/office uses, a community college (institutional use), and a minimum of two park sites, as well as the infrastructure improvements necessary to accommodate the new development.

The City's General Plan has provided the primary planning direction for the proposed project site and other sites within the Brentwood Planning Area. The proposed project would be consistent with Policy 1.2 and Action Program 1.2.1 of the General Plan *Land Use Element*. The project would provide the above-mentioned balanced mix of land uses and development types via a Planned Development designation. In addition, the project would allow the potential development of a community college on-site, which would be consistent with Action Program 1.2.6 of the *Land Use Element*, which states "[…] an adequate amount of institutional land uses to meet the […] educational needs of Brentwood residents and visitors" shall be provided. Furthermore, the project would be consistent with Policy 1.3 of the *Land Use Element*, because the associated *Draft Sciortino Ranch Design Guidelines* would ensure that the new development would provide adequate pedestrian services for the residents of the development.

The project would also be consistent with Policies 1.2 and 1.3 of the *Community Design Element* of the General Plan because the project would include the associated *Draft Sciortino Ranch Design Guidelines*, which include standards for architecture and site design, ensuring that the project is a well-defined neighborhood with quality landscaping and design.

It should be noted that the proposed project is located within the Southern sub-area of the proposed Brentwood Boulevard Specific Plan (BBSP), which currently designates the site primarily for Mixed-Use, Office Commercial, Residential, and Park/Open Space uses. The BBSP has been organized and structured to leverage the high visibility of Brentwood Boulevard and the essential role of the Boulevard as a primary link between Downtown Brentwood and the neighborhoods and workplace districts that have been envisioned to the north. The proposed project applicant has decided to process the Sciortino Ranch application separate from the BBSP, given the fact that the BBSP is a draft document and is still undergoing review and consideration by City staff. However, it should be noted that the proposed project's designations for land use and zoning would be required to be consistent with the proposed BBSP designations, should the BBSP be approved prior to approval of the proposed project.

In summary, the proposed project is consistent with the General Plan goals discussed above. The final authority for determination of General Plan consistency rests with the Brentwood City Council. Approval of the project is a discretionary action of the City Council. Should the City Council deny the project, an inconsistency would not occur. Should the City Council approve the project, the requested amendments to the General Plan would be approved concurrently and an inconsistency would not occur; therefore, a ***less-than-significant*** impact would result.

<u>Mitigation Measure(s)</u>
None required.

4.1-3 Consistency with existing zoning.

The current zoning designation for the project site is Planned Development (PD)-55. The proposed project would retain the existing zoning designation, but would include approval of an amendment to the PD-55 zone in order to divide the project area into 11 zoning sub-areas and provide applicable development standards for each sub-area. Permitted and Conditionally Permitted land uses are described for each zoning sub-area per a Zoning Matrix that is a component of the PD-55 zone (See Table 4.1-2). The zoning matrix describes the regulated uses for the mixed-use PD-55 zone. The PD-55 zone is inclusive of the matrix and the associated *Draft Sciortino Ranch Design Guidelines* that would be approved in conjunction with the project. The *Draft Sciortino Ranch Design Guidelines* define acceptable site planning and architectural design elements (e.g., setbacks, building heights) and address transitions between commercial and residential land uses.

The project site has been designated for urban uses and densities by the General Plan. In addition, the lands surrounding the project site have been designated by the General Plan for urban development and are primarily already developed with urban uses. The project site's PD-55 zoning, which allows for residential, commercial, office, and institutional uses, would be consistent with the City's goals for the project area.

It should be noted that the particular combination of land uses for the project site discussed in this EIR were chosen for analysis because they represent the worst-case environmental scenario; however, any combination of permitted uses found in the PD-55 Zoning Matrix would be possible with buildout of the project.
Although the proposed project requires an amendment to the PD-55 zoning designation, the project would be consistent with the City's anticipated use of the site based on approval of the proposed General Plan Amendment. Therefore, impacts would be considered ***less-than-significant.***

Mitigation Measure(s)
None required.

Cumulative Impacts

4.1-4 Increases in the intensity of land uses in the region due to the proposed project and all other projects in the Brentwood area.

The proposed Sciortino Ranch project, along with all known projects in the City of Brentwood, would change the intensity of land uses in the City's Planning Area. However, the Brentwood General Plan designates the project site for Very High Density Residential and Mixed-Use Business Park uses and such growth has previously been anticipated. It should be noted that, as shown in Table 4.1-3, the proposed project would be expected to result in a population increase of 1,242 people or 398 units, and result in a jobs decrease of 615.

Table 4.1-3
Existing and Proposed Development Intensity

Existing (General Plan)			Proposed (Sciortino Ranch)		
Land Use	**Acres[1]**	**Pop./Jobs[2]**	**Land Use**	**Acres**	**Pop./Jobs[2]**
GC	11.7	121	GC	9.9	102
VH	7[3]	655	VH	15.6[4]	1,460
BP	42.2	961	H	6.9[5]	259
			M	7.2[6]	178
			O	15.5	365
			P	5.1	-
Roads	5	-	Roads	5	-
Total Pop.	**-**	**655**	**Total Pop.**	**-**	**1,897[7]**
Total Jobs	**-**	**1,082**	**Total Jobs**	**-**	**467[8]**

[1] Existing acres are approximate
[2] Based on the following assumptions:
- 3.12 persons per household for residential uses
- 10.35 jobs per acre for GC (General Commercial)
- 22.77 jobs per acre for BP (Mixed-Use Business Park)
- 23.53 jobs per acre for O (Professional Office)

[3] Results in a total of 210 units at 30 du/ac (dwelling units per acre)
[4] Results in a total of 468 units at 30 du/ac
[5] Results in a total of 83 units at 12 du/ac
[6] Results in a total of 57 units at 8 du/ac
[7] Results in a population increase of 1,242, or 398 units
[8] Results in a jobs decrease of 615

Physical environmental cumulative impacts such as impacts related to noise, air quality, and traffic that would arise from development of the proposed project are assessed in other chapters of the EIR (See Chapter 4.3, Transportation and Circulation; Chapter 4.4, Air Quality; and Chapter 4.5, Noise for further analysis of these issues). In addition, all developments that are proposed and constructed within the City are reviewed for consistency with citywide land use controls and development standards during the course of the project review and approval process. Given the land use controls and development standards presently in use within the City of Brentwood, and the consistency of the project with the goals and policies found in the General Plan, cumulative land use impacts would be ***less-than-significant***.

Mitigation Measure(s)
None required.

Endnotes

[1] City of Brentwood. *General Plan Update.* Amended through January 2006.
[2] City of Brentwood. *General Plan Update EIR*. June 25, 2001.
[3] City of Brentwood. *Municipal Code*. 1987 (amended June 2008).
[4] City of Brentwood. *Draft Sciortino Ranch Design Guidelines*. November 7, 2008.

4.2 AESTHETICS

4.2 AESTHETICS

Introduction

The Aesthetics chapter of the EIR describes existing visual and aesthetic resources for the project area and the region, and evaluates potential aesthetic impacts of the project. In addition, the Brentwood General Plan goals and policies pertaining to aesthetics are described. The California Environmental Quality Act (CEQA) describes the concept of aesthetic resources in terms of scenic vistas, scenic resources (such as trees, rock outcroppings, and historic buildings within a State scenic highway), the existing visual character or quality of the project area, and light and glare impacts. The following impact analysis is based on information drawn from the *City of Brentwood General Plan Update*,[1] the *City of Brentwood General Plan Update EIR*,[2] and the *Draft Sciortino Ranch Design Guidelines*.[3]

Existing Environmental Setting

The following setting information provides an overview of the existing condition of visual resources within the vicinity of the proposed project site, which is located in Contra Costa County within the Brentwood city limits.

Regional Setting

A significant visual feature outside the Brentwood Planning Area is Mount Diablo. Rising to an elevation of 3,849 feet above mean sea level, Mt. Diablo is a prominent landmark dominating the western skyline. Scenic routes within the Brentwood Planning Area include State Route (SR) 4, Camino Diablo Road, Marsh Creek Road, Walnut Boulevard, Deer Valley Road, Lone Tree Way, and the planned SR 4 Bypass, as designated by the City of Brentwood General Plan Update EIR (p. 3.3-2). The scenic routes listed above have been identified as such due to the distant panoramic vistas of the Diablo Range and Mount Diablo, in particular, as well as rural farmland views located in the flatland areas and the surrounding hillsides.

The vast expanse of agricultural lands surrounding the City of Brentwood defines the visual character of the City. Large open fields predominate, along with an occasional residence or industrial structure. The open space creates a visual separation between Brentwood and the surrounding communities, and conveys a rural, “small-town” character. Within the City, visual character is defined by the arrangement and composition of urban development. The City originally developed along a grid street system that ran parallel and perpendicular to the Union Pacific Railroad. As Brentwood expanded, the street patterns developed along a north-south grid, as traditionally seen in the western United States.

Recent improvements to the main streets in downtown Brentwood reflected the desire to re-establish the area as a visually inviting and pedestrian-friendly environment. However, ongoing

development outside the original downtown area has resulted in a change to the historical visual atmosphere. Broad arterial streets, modern shopping centers, and many residential subdivisions with immature landscaping and similar architectural features all contribute to the current suburban appearance of the City of Brentwood.

Project Area Setting

The proposed project site is located one mile north of historic downtown Brentwood, within the northeastern portion of the City of Brentwood. The project site is within the North Brentwood Redevelopment Area and also within the limits of the proposed Brentwood Boulevard Specific Plan (BBSP) area, which is a draft document currently being reviewed by the City. The proposed project site, which is composed of approximately 65 acres of vacant land, is located at the intersection of Sand Creek Road and Brentwood Boulevard (See Chapter 3, Figure 3-2, Project Location Map). Brentwood Boulevard, which is currently SR 4, runs along the western boundary of the project site. Caltrans is in the process of relinquishing Brentwood Boulevard to the City; this relinquishment is anticipated to occur by the end of 2009. In the future, Sand Creek Road, which bisects the project site, is planned to be extended through the project site in order to connect to the Barrington neighborhood, which is located to the east of the project site.

The project site is currently surrounded by existing single-family residential uses to the north, residences and commercial retail buildings to the south, vacant land currently undergoing the preliminary stages of residential development to the east, and commercial uses across Brentwood Boulevard to the west (See Figure 4.2-1). One vacant parcel of land is located adjacent to the northwest boundary of the project site and two additional vacant parcels are located across Brentwood Boulevard to the southwest of the site.

Unique Visual Features of the Project Site

The project site primarily consists of vacant land. However, a natural gas well exists in the northeast portion of the site. In addition, near the western boundary is evidence of a former agricultural residence with associated buildings and an inactive water well. The concrete pads associated with these former buildings remain in place. Historic land uses on the proposed project site include agricultural and natural gas production.

Project Features

The proposed project includes the development of approximately 65 acres with a mixed-use urban development. The project would potentially create a neighborhood consisting of single-family residences and multi-family apartments, commercial/retail/office uses, a community college (institutional use), and two park sites. The project scenario analyzed includes up to 107,267 square feet of commercial/retail uses, 87,991 square feet of office uses, 228,690 square feet of institutional uses, 5.1 total acres of park uses, 140 single-family units, and 468 multi-family units. (See Chapter 3, Table 3-1, Land Use Assumptions for Analysis). The project would include the necessary roadway and utilities infrastructure, which would tie into existing off-site infrastructure.

Figure 4.2-1
View Looking East across the Proposed Project Site

The applicant is proposing design guidelines for the Sciortino Ranch project. The *Draft Sciortino Ranch Design Guidelines* are intended to establish guidelines for the development of the project site, to ensure "[…] a stylistically consistent and cohesive mix of land uses, while maintaining marketplace flexibility." The proposed *Draft Sciortino Ranch Design Guidelines* are specific to the Sciortino Ranch project; however, the planning and design concepts in the *Draft Sciortino Ranch Design Guidelines* could be used as a model for other developments in the City of Brentwood. In addition, the *Draft Sciortino Ranch Design Guidelines* are intended to ensure that the proposed project "[…] is integrated within the existing fabric of Brentwood and provides a transition to surrounding uses."

Regulatory Context

Specific federal or State regulations do not directly pertain to the visual quality of an area. However, the existing policies and regulations established in the City of Brentwood General Plan are listed below, as applicable.

City of Brentwood General Plan

The following are applicable General Plan goals and policies related to aesthetic resources from the City of Brentwood General Plan Community Design Element:

Goal 1 High Design Standards – Promote the highest standards of architecture and site design for all development projects, both public and private.

Policy 1.1 Protect Downtown – Avoid strip commercial development on the periphery of Brentwood that detracts from the economic viability of the Central Business District.

Policy 1.2 Well-Defined Neighborhoods – Residential neighborhoods should be well-defined with park and recreation facilities, schools, open space, and neighborhood commercial land uses that incorporate unifying landscape and architectural themes.

Policy 1.3 Quality Landscaping and Design – Encourage quality landscape and design.

Policy 1.4 Character of Streets – Create streets which are pedestrian friendly and provide views of abutting neighborhoods.

Goal 2 View of Natural Features – Preserve and enhance the views of dominant natural features (i.e., Mount Diablo, the Foothills, and local open space).

Policy 2.1 Preserve Views – Preserve views of the surrounding countryside, landmarks, and significant natural features such as Mount Diablo, nearby hills and ridgelines, and view shed corridors within developments.

Goal 3 Small Town Identity – Attempt to create a sense of "place" for the community by preserving and enhancing the identity and small town rural character of Brentwood.

Policy 3.1 Maintain Rural Character – Maintain and enhance the architectural character and rural heritage of the existing downtown area and the Brentwood community as a whole.

Policy 3.2 Neighborhood Integrity – Maintain and enhance the integrity and distinctive qualities of existing neighborhoods and districts within the Brentwood community.

Policy 3.3 Strong Transitions – Create strong transitions between the City of Brentwood and neighboring communities. Within Brentwood create major activity centers or nodes with intense development whose intensity decreases as you travel out of the node.

The following are applicable General Plan goals and policies related to aesthetic resources from the City of Brentwood General Plan Conservation and Open Space Element:

Goal 8 Open Space – Preserve and enhance natural open space in and around the Brentwood Planning Area.

City of Brentwood Zoning Ordinance

The Zoning Ordinance is an aesthetic review mechanism used by the City to maintain or improve aesthetic qualities within the City. Established codes regulate location, height, and size of buildings or structures, as well as signs, parking, and landscaping.

Impacts and Mitigation Measures

Standards of Significance

For the purposes of this Draft EIR, impacts are considered significant if implementation of the proposed project would cause:

- Substantial damage to scenic vistas or resources including, but not limited to, trees, rock outcroppings, and historic sites within a State scenic highway corridor;
- Substantial degradation of the existing visual character or quality of the site and the site's surroundings; or
- Creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Method of Analysis

The section below gives full consideration to the development of the project area and acknowledges the physical changes to the existing setting. Impacts to the existing environment of the project area are to be determined by the contrast between the site's visual setting before and after buildout of the proposed project. Although few standards exist to singularly define the various individual perceptions of aesthetic value from person to person, the degree of visual change can be measured and described in a reasonably objective manner in terms of visibility and visual contrast, dominance, and magnitude. Current residents adjacent to the project site and travelers along Brentwood Boulevard would be considered sensitive to the visual and aesthetic alteration of the proposed project site. The standards of significance listed above will be used to determine the significance of any visual or aesthetic alterations of the proposed project site.

Project-Specific Impacts and Mitigation Measures

4.2-1 Impacts to scenic vistas and natural resources, including resources found within State scenic highway corridors.

Uninterrupted views of the Diablo Range and, on the western horizon, Mount Diablo exist throughout the Brentwood Planning Area. The General Plan EIR indicates that the scenic vistas and visual resources within the City of Brentwood contribute to the quality of the community. The General Plan Update EIR allows for development at urban densities and intensities in portions of the Brentwood Planning Area that are currently open space or agricultural land, such as the area in the southern portion of the City along the planned SR 4 Bypass south of Marsh Creek Road. At buildout, this development would result in a loss of open space that is considered a principal scenic resource in the

City. Similarly, buildout of the proposed project would replace vacant rural land with urban uses, which could create impacts to scenic vistas.

Impacts to scenic vistas would include impacts to scenic resources found adjacent to area roadways that have been designated as scenic routes, such as SR 4, which runs along the western boundary of the project site. Scenic resources found adjacent to area roadways include open space, which is considered the principal scenic resource within the City, and agricultural areas such as orchards, and views of hillsides and ridgelines. The designated scenic routes provide pleasant viewing experiences for motorists traveling along these thoroughfares. However, SR 4 has undergone increasing urbanization of nearly all land use types. In addition, inconsistent site layouts, mixed land uses, and building setbacks have developed over the years along SR 4.

The Brentwood General Plan provides for increased urbanization compared to the existing development in the City of Brentwood. In addition, the General Plan includes policies and associated programs that are intended to protect the City's visual resources from the impacts of future development. The General Plan includes the following policies and programs related to protection of visual resources:

- Protection of the environmental features that make Brentwood an attractive and desirable place to live, work, and visit;
- Protection of hillsides and ridgelines from urban development to maintain scenic view corridors and preserve an unspoiled natural setting in the City of Brentwood;
- Preservation and protection of scenic resources and elements in and around Brentwood, including natural habitat and scenery;
- Preservation of agricultural lands adjacent to urban development, along the periphery of the community, and between development projects; and
- Preservation of natural open space in and around the Brentwood Planning Area.

The General Plan Update EIR includes these policies and programs to reduce the impacts of future development in the General Plan area to a less-than-significant level.

Although the proposed project would result in the loss of some scenic agricultural resources, the proposed project site is currently designated for mixed-use development in the General Plan. In addition, the *Draft Sciortino Ranch Design Guidelines*, which would be approved in conjunction with approval of the proposed project, include detailed development standards to ensure that impacts to scenic resources are minimized.

In addition, the *Draft Sciortino Ranch Design Guidelines* include additional requirements for both commercial and residential development that are intended to provide and preserve open space, parks, trees, and landscaping, all of which are considered scenic resources. The *Draft Sciortino Ranch Design Guidelines* indicate that the project would "[…] feature a new urbanist park system that encourages design elements such as urban plazas, village greens, and landscaped pedestrian paseos woven into the fabric of the mixed-use design." The development requirements related to landscaping are intended to ensure that existing mature healthy trees are preserved and incorporated into the proposed

development, where feasible, and to ensure that any trees that are removed are replaced elsewhere in the development at a two-to-one ratio. The *Draft Sciortino Ranch Design Guidelines* also include development requirements that would ensure that landscaped buffers are provided between the proposed project's commercial development and existing and proposed residential development.

The proposed project would require the approval of a General Plan Amendment to redesignate the proposed project site from Very High Density Residential (VHDR) and Mixed-Use Business Park (BP) to show the SPA-A designation only, which would ensure consistency with the proposed Planned Development (PD)-55 zoning designation for the project site and allow for greater flexibility associated with future development of the site. Aesthetic impacts associated with urban development of the project site were previously analyzed in the General Plan EIR and mitigation measures were provided to reduce the impacts to a less-than-significant level. Compliance with General Plan policies and mitigation, as well as the *Draft Sciortino Ranch Design Guidelines*, would result in a ***less-than-significant*** impact to scenic resources.

Mitigation Measure(s)
None required.

4.2-2 Impacts related to the existing visual character or quality of the site and surroundings.

Currently, the proposed project site is vacant rural land, the majority of which is surrounded by existing or planned residential and commercial development. Implementation of the proposed project would introduce into the project area an urban Planned Development setting that includes up to 140 single-family and 468 multi-family residential units, as well as retail/commercial, institutional, and park uses, on approximately 65 acres. Because the project site currently provides some open views from adjacent roadways and surrounding properties, the change in the character of the site would be recognizable. The change in the site from rural to urban development would constitute a permanent alteration of the existing visual character of the project site.

The *Draft Sciortino Ranch Design Guidelines*, which would be approved in conjunction with approval of the proposed project, include development standards with which the proposed project would be required to comply. The development standards address site development, transitions to surrounding uses, building design, standardized setbacks, accents, landscaping, and lighting. The development standards are intended to establish guidelines for the development of the project site, ensuring a stylistically consistent and cohesive mix of land uses, as well as integration of the proposed project within the existing fabric of the City of Brentwood. The following are some of the pertinent design objectives, site planning guidelines, and other commercial and residential development requirements from the *Draft Sciortino Ranch Design Guidelines*, which pertain to aesthetics and would serve to ensure an aesthetically pleasing project:

2. Commercial Development

2.1.2 Purpose

- Provide visual continuity along street frontage;
- Maintain a building scale which is consistent with the City's small town rural heritage and historic qualities of Brentwood;
- Encourage corporate and franchise design to adapt to the unique character of their sites;
- Encourage commercial development to be constructed in patterns that are more pedestrian friendly;
- Convey the City's design expectations to the property owners and developers;
- Protect property owners' investments by discouraging inconsistent developments; and
- Streamline the development review process by more clearly communicating community expectations to property owners and developers.

2.1.3 Site Planning Guidelines

A) Orient buildings and entry to street frontage;
B) Reduce dominant parking fields between buildings and arterial streets;
C) Provide areas for landscaping between the street edges and buildings;
D) Whenever possible, incorporate existing trees into new landscape areas to promote a sense of heritage to a space, as well as shade;
E) Provide clear pedestrian pathways;
F) Minimize the visual prominence of service and loading areas;
G) Provide buffers between new development and residential neighborhoods;
H) Provide landscape planting areas between buildings and adjacent parking areas;
I) Provide visual buffer for prominent utility and mechanical elements;
J) Consolidate vehicular entries;
K) Connect adjacent parcel parking lots where feasible;
L) Avoid parking lots on street intersection corners;
M) Provide for and screen stacking of service vehicles on-site;
N) Provide a comprehensive site and building exterior lighting plan;
O) Provide secured parking for bicycles conveniently located near building entries; and
P) Plan drive thru windows to minimize adverse visual impacts to public streets.

3. Residential Development

3.1 Residential Design Guidelines

Goals

- Establish consistent high quality residential design in the PD-55 zone;
- Link Residential as well as Commercial areas within the zone into a cohesive community environment;
- Promote both visual continuity and diversity;
- Promote a pedestrian friendly community;
- Provide a mixed-use community; and
- Continue to ensure Brentwood remains a desirable and attractive place to live as the City grows.

Community Expectations

- New housing will foster a sense of community and place;
- New residential development will respect the scale and character of adjacent homes and neighborhoods;
- Pedestrian orientation within and between neighborhoods will be emphasized to enhance mobility;
- Variety and diversity of architectural character will be encouraged within all residential zones;
- Enhanced design treatment will be expected on residential facades that are facing or adjacent to public streets;
- Garages that dominate street frontages will be discouraged;
- High-quality durable materials will be used throughout new residential development;
- Careful attention will be given to architectural and landscape details including roof overhangs, windows, porch columns and railings, trellises, and other features that add visual richness to the home and neighborhood; and
- A strong commitment will be made to front yard landscaping in all new residential development and homeowners' association parcels, where applicable. Plant palettes should include shade and accent trees, flowering plants, and other interesting plant selections.

In addition, as stated above, the *Draft Sciortino Ranch Design Guidelines* include additional requirements for both commercial and residential development that are intended to provide and preserve open space, parks, trees, and landscaping, which would further ensure an aesthetically pleasing project.

According to the Brentwood General Plan Land Use Map (See Figure 4.2-1 in the Land Use Chapter of this Draft EIR), the proposed project site is designated as Very High Density Residential (20.1-30.0 du/ac) and Mixed-Use Business Park. The proposed project would require the approval of a General Plan Amendment to redesignate the proposed project site as Special Planning Area A (SPA-A), which would ensure consistency with the proposed PD-55 zoning designation for the project site, and allow for greater flexibility associated with future development of the site. However, the proposed land use designations and densities associated with the project would be similar to those found in the General Plan, which previously designated the project site for urban uses. Aesthetic impacts associated with urban development within the General Plan area were previously analyzed in the General Plan EIR, and mitigation measures were provided to reduce the impacts to a less-than-significant level.

The City of Brentwood General Plan EIR concluded that the implementation of the General Plan's goals and policies, in addition to adherence to mitigation measures, would reduce impacts to the visual character of Brentwood to a less-than-significant level. In addition, the project would be required to comply with the development standards found in the *Draft Sciortino Ranch Design Guidelines*. Therefore, the proposed project would have a ***less-than-significant*** impact related to the existing visual character or quality of the site and surroundings.

Mitigation Measure(s)
None required.

4.2-3 Impacts associated with new sources of light and glare.

The proposed project site is currently vacant rural land. Two vacant parcels exist immediately adjacent to the southwestern boundary of the project site, and an additional vacant parcel exists immediately adjacent to the northwestern boundary of the site. In addition, residential development exists to the north and south of the site, and to the east of the site, residential lots have been developed. The introduction of building and street lighting within this currently undeveloped area would alter the existing unlit conditions. Night lighting associated with the proposed residential, commercial, and other development would be visible to neighboring properties that would be considered sensitive receptors to the new sources of light and glare. Because the setting is already predominantly urbanized, and development of the proposed project site is anticipated in the General Plan, implementation of the project is not expected to result in substantially different light and glare impacts from those analyzed in the General Plan.

In addition, any increase in the amounts of light and glare generated by implementation of the proposed project would be reduced by the standards and guidelines for lighting design that are included in the *Draft Sciortino Ranch Design Guidelines*. The *Draft Sciortino Ranch Design Guidelines* include the following Site Planning Guideline, which would reduce impacts related to lighting and glare:

2.2.N. Provide a comprehensive site and building exterior lighting plan.

1) Provide a unified master lighting plan for the entire site;
2) Use non-glare fixtures;
3) Use pedestrian scale lighting and poles nearby buildings and pathways;
4) Avoid lighting adjacent residential parcels with use of hooded lights or screens;
5) Lighting of vertical building elements is encouraged;
6) For washing lighting, use smallest luminaries available to accomplish task; and
7) Avoid strictly utilitarian lighting whenever possible.

Because the *Draft Sciortino Ranch Design Guidelines* include development requirements and guidelines that regulate the introduction of new sources of light and glare, impacts associated with new sources of light and glare created by the proposed project would be considered ***less-than-significant***.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

4.2-4 Long-term impacts to the visual character of the region from the proposed project in combination with existing and future developments in the Brentwood area.

The proposed project is not expected to significantly contribute to a cumulative change in the visual character of the City of Brentwood or the Contra Costa County region. Due to the existing urban setting of the proposed project site and the continued urban uses planned for the vicinity of the proposed project at buildout of the General Plan, the larger context of the visual impact of the proposed project would not be considered cumulatively significant. The majority of the properties surrounding the proposed project site are currently developed for a wide range of uses, including residential, commercial, park, school, and civic uses. Properties adjacent to the project site primarily consist of residential uses.

Development of the project would be guided by the *Draft Sciortino Ranch Design Guidelines*, which would be approved in conjunction with the proposed project, and are designed to establish guidelines for the development of the project site to ensure a stylistically consistent and cohesive mix of land uses, as well as to ensure integration of the proposed project within the existing fabric of the City of Brentwood. In addition, the *Draft Sciortino Ranch Design Guidelines* are intended to provide planning design tools to support and promote implementation of future mixed land uses within the PD-55 zone, and be consistent with the North Brentwood Redevelopment Area and the pending Brentwood Boulevard Specific Plan (within which the project would be located) policies and economic revitalization goals.[4]

Implementation of the proposed project would not conflict with existing adjacent uses, but would instead promote compatibility with those uses. Therefore, development of the proposed project site would not contribute to a significant change in the visual character of the area. In addition, as mentioned previously, changes to views associated with buildout of the project site would be considered less-than-significant. Therefore, cumulative impacts associated with implementation of the Sciortino Ranch project would be ***less-than-significant***.

Mitigation Measure(s)
None required.

Endnotes

[1] City of Brentwood. *General Plan Update.* Amended through January 2006.
[2] City of Brentwood. *General Plan Update EIR*. 2001.
[3] City of Brentwood. *Draft Sciortino Ranch Design Guidelines*. November 7, 2008.
[4] Ibid.

4.3 TRANSPORTATION AND CIRCULATION

4.3 TRANSPORTATION AND CIRCULATION

Introduction

The Transportation and Circulation chapter of the EIR analyzes transportation and parking impacts that would result from the implementation of the proposed project. The information in the chapter is based on the *Sciortino Ranch Traffic Impact Analysis*[1] prepared by Kimley-Horn and Associates, Inc. (See Appendix D). The traffic analysis includes traffic movement counts, traffic projections, and technical analyses. Potential impacts to the off-site roadways, bicycle, pedestrian, and transit systems are evaluated, as well as site access, on-site circulation, and parking. Mitigation measures are suggested to reduce or eliminate potential significant impacts of the project.

Environmental Setting

Project Setting

The Sciortino Ranch project (proposed project) is a 65-acre mixed-use project located east of Brentwood Boulevard, and on the north and south sides of the future extension of Sand Creek Road in the City of Brentwood, California. The analyzed project would consist of multi-family apartments, 140 single-family detached homes, 107,267 square feet (s.f.) of retail uses, 87,991 s.f. of office uses, and 228,690 s.f for a community college. See Figure 4.3-1 for the proposed project location.

Vicinity Roadways

The following are the primary roadways in the vicinity of the proposed project.

Brentwood Boulevard

Brentwood Boulevard is a north-south arterial roadway that traverses through the project area. Within the City, Brentwood Boulevard is designated as State Route (SR) 4, which provides connectivity among the communities in the Sierra Nevada Mountains, the San Joaquin Valley, and the San Francisco Bay Area. South of Havenwood Avenue, Brentwood Boulevard is a four-lane roadway with curbs and gutters, and without on-street parking. North of Havenwood Avenue, Brentwood Boulevard is a two-lane facility without paved shoulders. The roadway is fronted by a wide variety of commercial and industrial uses, with numerous driveways to adjacent parcels. Within the general project area, Brentwood Boulevard currently serves approximately 19,300 vehicles per day (vpd).

Figure 4.3-1
Project Vicinity Map

State Route 4 Bypass

The SR 4 Bypass (Bypass) is a roadway construction project that will replace the existing SR 4 from just south of the Main Street Interchange in the City of Oakley to the existing intersection with Marsh Creek Road. Phase 1 of the project will be constructed in three segments. Segment 1 extends from just east of the SR 4 / Hillcrest Avenue Interchange in the City of Antioch to Lone Tree Way and will consist of a six-lane freeway between existing SR 4 and the Laurel Road Interchange, as well as a four-lane freeway from Laurel Road to Lone Tree Way. Phase 1 of Segment 2 has been constructed as a two-lane expressway from Lone Tree Way to Balfour Road, and will eventually be converted to a full freeway with interchanges at Sand Creek Road and Balfour Road. Segment 3 extends from Balfour Road south to Marsh Creek Road as a two-lane expressway, then along Marsh Creek Road (East-West Connector) as a two-lane conventional highway, connecting to existing SR 4 (Byron Highway). The southerly limits of the project (now called the Vasco Road Extension) are from Marsh Creek Road to Vasco Road at Walnut Boulevard.

Lone Tree Way

Lone Tree Way is an arterial roadway located west of Brentwood Boulevard at the north end of the project area. Lone Tree Way runs north-south from SR 4 in Antioch to James Donlon Boulevard, where Lone Tree Way then becomes an east-west roadway, until terminating just east of Brentwood Boulevard. This roadway provides regional connectivity from the project area to the City of Antioch, and is fronted by, and provides direct access to, many commercial land uses. Through the project area, Lone Tree Way accommodates approximately 10,600 vpd. Lone Tree Way is planned for widening to four lanes from O'Hara Avenue to Brentwood Boulevard.

Sand Creek Road

Sand Creek Road is an east-west collector roadway that connects the SR 4 Bypass to the west and Brentwood Boulevard to the east. Sand Creek Road accommodates approximately 7,700 vpd west of Brentwood Boulevard, and has four travel lanes east of Fairview Avenue. Sand Creek Road is planned to be extended east of Brentwood Boulevard to Sellers Avenue. The City has a development agreement in place for the near-term construction of Sand Creek Road from Brentwood Boulevard to Garin Parkway.

Central Boulevard

Central Boulevard is an east-west collector roadway that extends from west of Fairview Avenue east to Brentwood Boulevard, where Central Boulevard then becomes Sycamore Avenue. West of Griffith Lane, Central Boulevard has two travel lanes and between Griffith Lane and Brentwood Boulevard, Central Boulevard has four travel lanes. West of Brentwood Boulevard, Central Boulevard provides access to shopping centers, other commercial uses, and a number of neighborhoods.

Other roadways incorporated in this analysis (i.e., Gregory Lane) are local roads that provide connectivity from Brentwood Boulevard to surrounding neighborhoods and/or other portions of the City.

Project Study Area

The traffic analysis for the proposed project, prepared by Kimley-Horn and Associates, Inc., includes level of service (LOS) analysis for the following intersections, listed with existing traffic control:

1. Brentwood Boulevard @ Lone Tree Way (Signalized);
2. Brentwood Boulevard @ Sunrise Drive (Side-Street Stop Control);
3. Brentwood Boulevard @ Gregory Lane (Side-Street Stop Control);
4. Brentwood Boulevard @ Homecoming Way (Side-Street Stop Control);
5. Brentwood Boulevard @ Grant Street / Sunset Road (Signalized);
6. Brentwood Boulevard @ Sunset Court (Side-Street Stop Control);
7. Brentwood Boulevard @ Havenwood Avenue (Side-Street Stop Control);
8. Brentwood Boulevard @ Applewood Common (Signalized);
9. Brentwood Boulevard @ Sand Creek Road (Signalized);
10. Brentwood Boulevard @ Technology Way (Signalized);
11. Brentwood Boulevard @ Village Drive (Side-Street Stop Control);
12. Brentwood Boulevard @ Central Boulevard/Sycamore Avenue (Signalized); and
13. Sand Creek Road @ O'Hara Avenue (Signalized).

In addition to the above-identified intersections, the traffic analysis also addressed impacts to the following roadway segments within the vicinity of the proposed project site:

1. Lone Tree Way west of Brentwood Boulevard;
2. Brentwood Boulevard north of Sand Creek Road;
3. Brentwood Boulevard south of Sand Creek Road; and
4. Sand Creek Road west of Brentwood Boulevard.

Figure 4.3-2 illustrates the study facilities, existing traffic control, and existing lane configurations.

Existing Conditions

Analysis of existing traffic conditions at the study intersections was based on peak-hour traffic counts conducted in October 2008. Local schools were in session during the week that the data was collected. The weekday AM and PM peak-hour intersection turning movement traffic counts were conducted between the hours of 7:00 a.m. and 9:00 a.m. and 4:00 p.m. and 6:00 p.m., respectively. The existing peak-hour turn movement volumes and roadway segment volumes are presented in Figure 4.3-3.

Figure 4.3-2
Project Location and Study Intersections

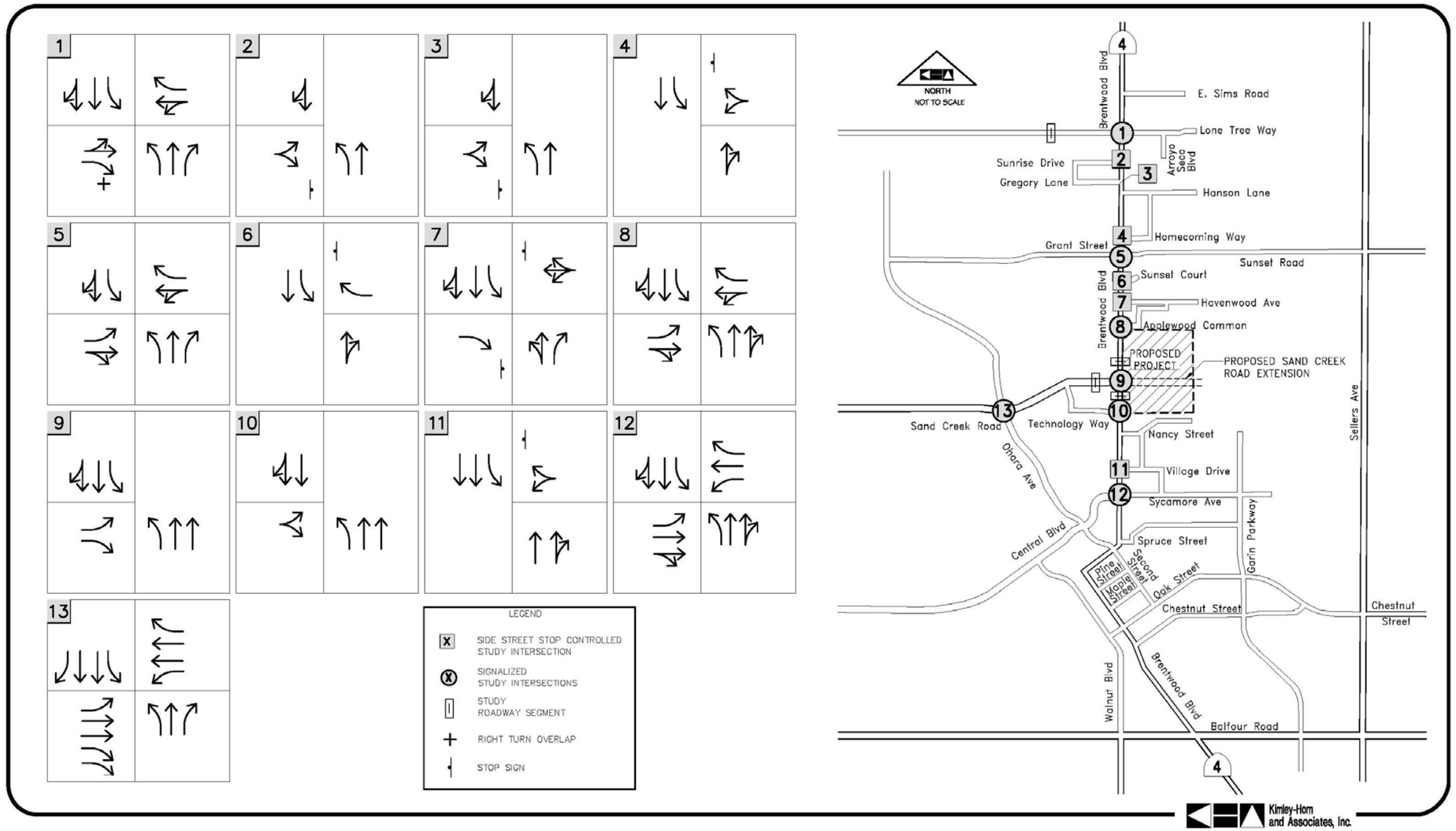
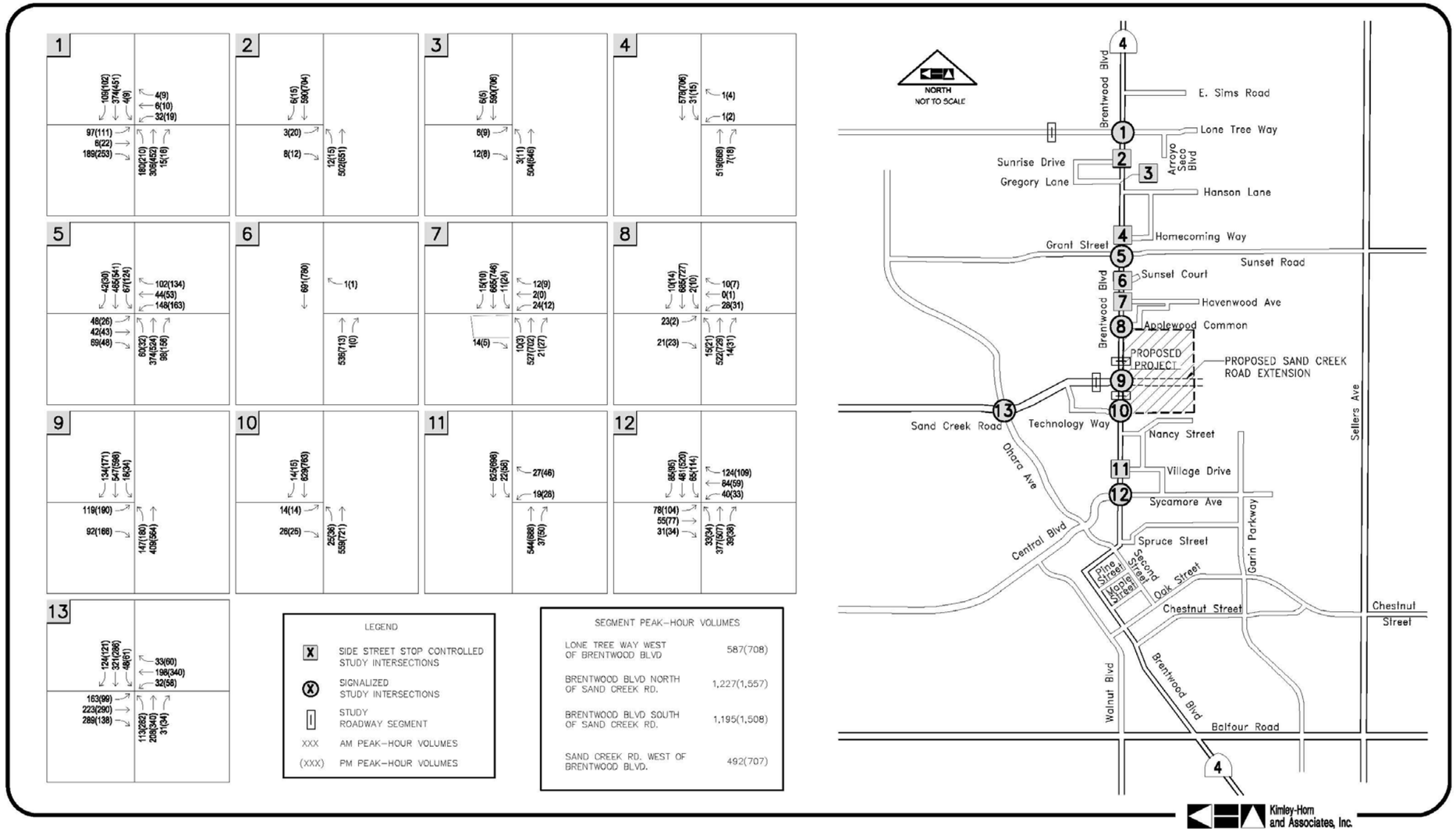


Figure 4.3-3
Existing (2008) Peak-Hour Traffic Volumes



Intersections

Table 4.3-1 presents the existing peak-hour intersection operating conditions and signal warrants for the study intersections. As indicated in Table 4.3-1, the study intersections operate from LOS A to LOS D during the AM and PM peak-hours.

Roadway Segments

Table 4.3-2 presents the existing roadway segment levels of service for the study roadway segments. As indicated in Table 4.3-2, the roadway segments operate at LOS A to LOS C.

Existing Bicycle and Pedestrian Facilities

The four-lane sections of Brentwood Boulevard, between Central Avenue and Havenwood Avenue, have Class II bike lanes. North of Havenwood Avenue, Brentwood Boulevard is two lanes and generally lacks bike lanes and sidewalks. In such areas, bicyclists and pedestrians must use the shoulder of the roadway, which is paved and varies in width. Class II bike lanes exist on Central Avenue, east of Brentwood Boulevard. The other project area roadways generally lack Class II bike lanes. In addition, Class I bike trails, maintained by the East Bay Regional Park District, exist along the Marsh Creek Trail and the East Bay Municipal Utility District's Mokelumne Aqueduct right-of-way.

Existing Transit Facilities

Transit service in the City of Brentwood is provided by Tri-Delta Transit (TDT). Tri Delta Transit currently operates six local routes (383, 384, 385, 386, 391, & Dimes-A-Ride), two express commuter routes (300, DX) on weekdays, and a single local route (393) on weekends. Two of the six local routes are trunk line services that operate on the SR 4 / Brentwood Boulevard corridor through Brentwood. Bus routes in the vicinity of the project are illustrated in Figure 4.3-4.

Regulatory Context

Existing transportation polices, laws, and regulations that would apply to the proposed project are summarized below. This information provides a context for the impact discussion related to the project's consistency with applicable regulatory conditions.

Local Regulations

Contra Costa Transportation Authority

The Contra Costa Transportation Authority (CCTA) serves as the Congestion Management Agency (CMA) for Contra Costa County. CCTA adopted the County's first Congestion Management Program (CMP) in October 1991. The most recent CMP, referred to as the 2001 CMP Update, represents the fifth biennial update that the Authority has prepared.

Table 4.3-1
Existing Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec) or V/C Ratio[2]	LOS	Delay (sec) or V/C Ratio[2]	LOS	
1	Brentwood Blvd. @ Lone Tree Way	Signal	0.341	A	0.378	A	N/A
2	Brentwood Blvd. @ Sunrise Drive	SSSC	14.7	B	25.7	D	No
3	Brentwood Blvd. @ Gregory Lane	SSSC	15.3	C	22.1	C	No
4	Brentwood Blvd. @ Homecoming Way	SSSC	16.8	C	18.5	C	No
5	Brentwood Blvd. @ Grant Street/Sunset Road	Signal	0.527	A	0.579	A	N/A
6	Brentwood Blvd. @ Sunset Court	SSSC	11.6	B	13.3	B	No
7	Brentwood Blvd. @ Havenwood Avenue.	SSSC	19.1	C	21.6	C	No
8	Brentwood Blvd. @ Applewood Common	Signal	0.239	A	0.258	A	N/A
9	Brentwood Blvd. @ Sand Creek Road	Signal	0.353	A	0.439	A	N/A
10	Brentwood Blvd. @ Technology Way	Signal	0.225	A	0.270	A	N/A
11	Brentwood Blvd. @ Village Drive	SSSC	14.5	B	19.5	C	No
12	Brentwood Blvd. @ Central Blvd./Sycamore Avenue	Signal	0.290	A	0.333	A	N/A
13	Sand Creek Road @ O'Hara Avenue	Signal	0.314	A	0.421	A	N/A

[1] Per the California Manual on Uniform Traffic Control Devices (CMUTCD), Section 4C, September 26, 2006.
[2] Control delay for worst minor approach (worst minor movement) for TWSC.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

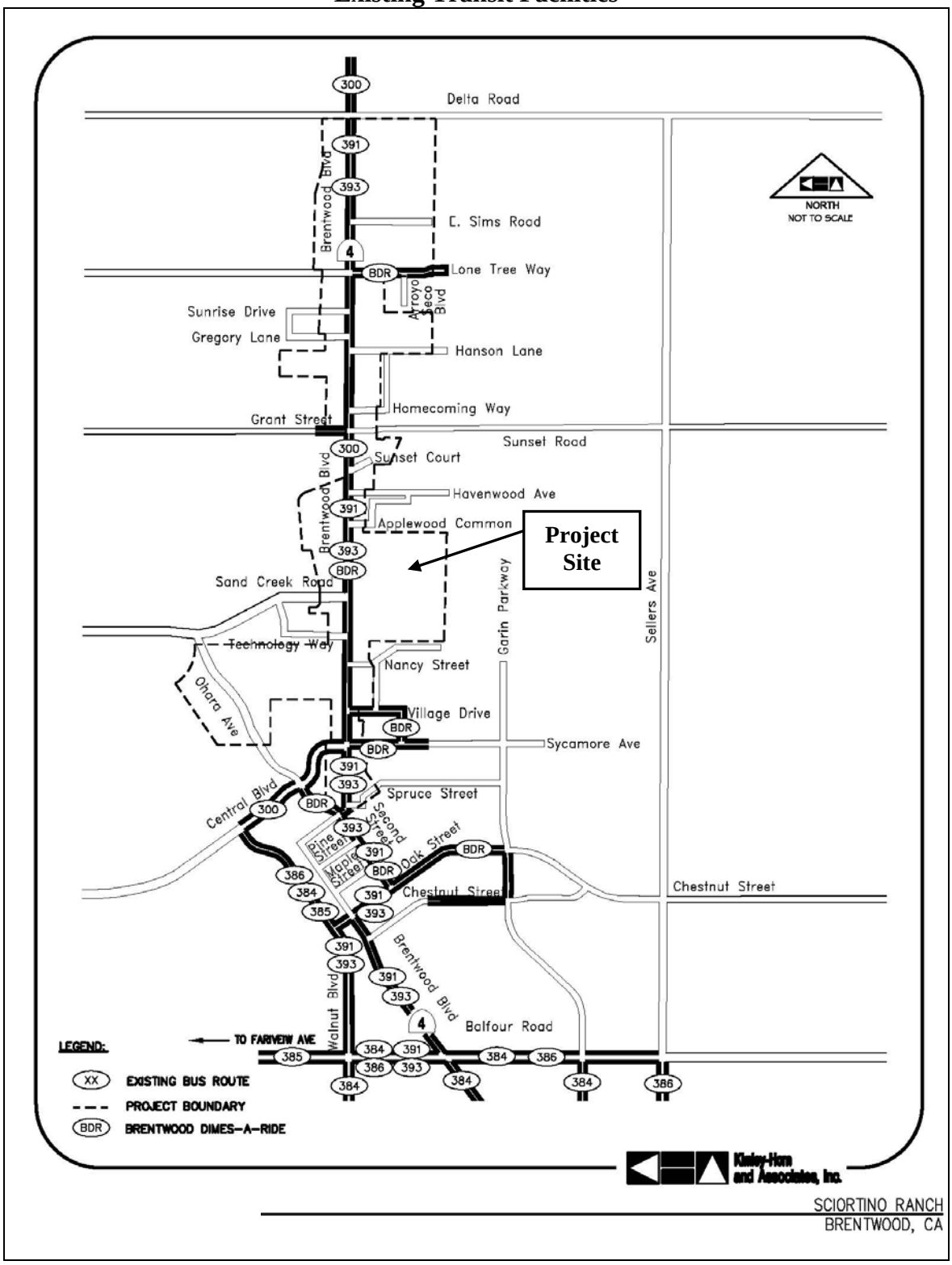
Table 4.3-2
Existing Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS	PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.[2]	Collector	2	62.7%	C	65.1%	C
2	Brentwood Blvd. north of Sand Creek Road[3]	Arterial	4	294/390	A/A	425/453	A/A
3	Brentwood Blvd. south of Sand Creek Road[3]	Arterial	4	300/345	A/A	429/440	A/A
4	Sand Creek Road west of Brentwood Blvd. [2]	Arterial	4	125/167	A/A	205/202	A/A

1 PTSF = Percent Time Spent Following Pc/Hr/Ln = passenger cars per hour per lane
2 Results for this roadway segment are presented in NB/SB format (where applicable).
3 Results for this roadway segment are presented in EB/WB format (where applicable).

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Figure 4.3-4
Existing Transit Facilities



East County Action Plan

The East County Action Plan contributes to the Countywide Comprehensive Transportation Plan. The Countywide Comprehensive Transportation Plan is compiled by the CCTA. The entire transportation planning process is mandated by Measure C (See below). The Regional Transportation Planning Committee for eastern Contra Costa County, TRANSPLAN, is responsible for the East County Action Plan. The Technical Advisory Committee for TRANSPLAN developed recommendations on which the East County Action Plan is based. Final decisions, direction, and policy were set by the TRANSPLAN Committee, which consists of elected officials and planning commissioners from East County jurisdictions. The original East County Action Plan was developed in 1993, and updates were prepared in 1997 and 2000. Routes of Regional Significance in eastern Contra Costa County are the focus of the East County Action Plan.

Measure C

The overall goal of the CCTA Growth Management Program (GMP) called for in Measure C-1988 is to "achieve a cooperative process for Growth Management on a countywide basis, while maintaining local authority over land use decisions and the establishment of performance standards." Using a formula based on road miles and population, CCTA allocates 18 percent of the sales tax revenues received to local jurisdictions that comply with GMP requirements.

Brentwood participates in the Measure C program as a member of the TRANSPLAN subregional transportation planning committee, which consists of Antioch, Brentwood, Oakley, Pittsburg, and Contra Costa County.

<u>City of Brentwood General Plan</u>

The following are applicable goals and policies from the City of Brentwood General Plan related to transportation and circulation:

Goal 1 Movement of People and Goods: A transportation system that provides safe and efficient movement of people and goods within and through the City of Brentwood and promotes the use of alternatives to the single-occupant vehicle.

Policy 1.1 Balanced Transportation System: Develop and maintain a balanced transportation system within the City that provides a choice of transit, bicycle, equestrian, pedestrian and private automobile modes.

Action Program 1.1.1 Level of Service: Maintain a level of service standard “D” or better throughout the vehicular street system.

Goal 2 Transportation Alternatives: A transportation system that encourages walking, bicycling, and public transit use and encourages shorter commute trips for Brentwood residents.

Policy 2.1 Development Patterns: Recognize the link between land use and transportation. Promote land use and development patterns that encourage walking, bicycling, and transit use. Emphasize well-designed high-density and mixed land use patterns that promote transit and pedestrian travel.

Goal 3 Livability: A transportation system, including safe and adequate streets, trails, signals, sidewalks, pathways, curbs, gutters, streetlights, transit amenities, and signage that maintains and enhances the livability of the City.

Policy 3.1 Integrated Transportation System: Integrate the transportation system into the physical structure of the City in order to enhance livability, while providing an efficient and safe means of moving people and goods.

Impacts and Mitigation Measures

The standards of significance, methods of analysis, and traffic impacts and mitigation measures are summarized below for the proposed project.

Standards of Significance

According to the CEQA Guidelines, a project would result in a significant impact if the project would cause an increase in traffic that is substantial and adverse in relation to the traffic load and capacity of the existing street system. This standard of significance relates to automobile traffic only and does not address the potential effects on other travel modes, including transit, bicycle, and pedestrian facilities. In order to evaluate a broad range of travel characteristics, the following standards of significance apply to the transportation impacts discussed in this Draft EIR.

Impacts to intersections are created when traffic associated with the proposed project causes an intersection that operates at an acceptable level of service (LOS) without the proposed project to fall below a specific threshold. Per the City's General Plan,[2] the City must "maintain a level of service standard of 'D' or better throughout the vehicular street system." Furthermore, according to the General Plan EIR, a significant impact would occur if the addition of the proposed project results in any of the following:

- Causes LOS at a signalized intersection to deteriorate from an acceptable level (LOS D or better with a volume to capacity (V/C) ratio equal to or less than 0.85) to an unacceptable level (LOS D or worse with a V/C ratio greater than 0.85);
- Causes the V/C ratio at a signalized intersection operating at an unacceptable level (V/C ratio greater than 0.85) to increase by more than 0.01;
- Causes LOS at an unsignalized intersection to degrade to worse than mid-LOS D (average delay of 30 seconds per vehicle);
- Causes an unsignalized intersection to meet traffic signal warrants based on Warrant 3B (peak-hour volume warrant) as presented in the *California Manual of Uniform Traffic Control Devices (CMUTCD)*, dated September 26, 2006;

- Conflicts with existing, planned, or possible future transit, bicycle, and/or pedestrian facilities and services;
- Conflicts or creates demand for public transit services above that which is provided, or planned;
- The path of travel between the project area and transit stops would not meet current California Title 24 handicap accessibility standards; or
- Does not provide connections to bicycle and pedestrian circulation systems of the surrounding area.

Traffic Service Objectives (TSOs) have been developed by TRANSPLAN. These TSOs are included in the East County Action Plan and define a significant impact threshold of LOS E for unsignalized intersections along SR 4 (non-freeway segments) between SR 160 and Balfour Road. However, the City's more conservative standard of significance, LOS D, was applied for this project.

Methods of Analysis

Analysis of significant environmental impacts at intersections is based on the concept of Level of Service (LOS). The LOS of an intersection is a qualitative measure used to describe operational conditions. LOS ranges from A (best), which represents minimal delay, to F (worst), which represents heavy delay and a facility that is operating at or near functional capacity.

Contra Costa County Measure C established a sales tax to be used to fund transportation improvements in Contra Costa County. The measure includes a growth management program and requires the Contra Costa Transportation Authority (CCTA) to develop a comprehensive transportation plan and update the plan every other year. To receive a share of the sales tax generated by Measure C, local jurisdictions must adhere to the LOS standards that Measure C applies to local streets and roads. The Measure C standards are applied to streets and roads for which the jurisdictions are responsible. Each jurisdiction must take appropriate action to ensure that the LOS standards are met, including routes of regional significance. Designated regional routes include all the freeways and state highways, and the most significant arterials in Contra Costa County.

The CCTA classifies several roadways within the project area as routes of regional significance, including Brentwood Boulevard and Lone Tree Way.[3] As such, intersections along these routes require analysis utilizing Growth Management Program procedures outlined in the CCTA Technical Procedures, dated July 19, 2006. The CCTA Technical Procedures require the analysis of intersections to be based on the Intersection Capacity Utilization (ICU) methodology. The ICU methodology describes the operation of an intersection in terms of LOS based on corresponding volume to capacity (v/c) ratio. Based on City of Brentwood and CCTA requirements, this traffic analysis was completed using the CCTALOS module at signalized intersections, and the *Highway Capacity Manual* (HCM) module within Traffix® at unsignalized intersections.

The HCM includes procedures for analyzing two-way stop controlled (TWSC) and all-way stop controlled (AWSC) intersections. The TWSC procedure defines LOS as a function of average control delay for each minor street approach movement. Conversely, the AWSC procedure defines LOS as a function of average control delay with each intersection approach analyzed independently. Table 4.3-3 presents intersection LOS definitions as applied to signalized and unsignalized intersections in the ICU and HCM.

Table 4.3-3
Intersection Level of Service Criteria

Level of Service	Description	Signalized (Intersection Volume to Capacity ratio, v/c)	Unsignalized (Average Control Delay per Vehicle, sec/veh.)
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream	< 0.6	< 10
B	Stable traffic. Traffic flows smoothly with few delays.	0.61 – 0.70	> 10 – 15
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	0.71 – 0.80	> 15 – 25
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak-hours.	0.81 – 0.90[1]	> 25 – 35
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	0.91 – 1.00	> 35 – 50
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	> 1.00	> 50

[1] It should be noted that the City of Brentwood uses the more conservative v/c ratio of 0.81-0.85 for LOS D. Impacts in this chapter have been assessed according to the City's threshold.

Sources: Contra Costa Transportation Authority Technical Procedures 2006 and Transportation Research Board, Highway Capacity Manual 2000, National Research Council, 2000.

Roadway segment LOS definitions for two-lane and multilane highways are based on the *Highway Capacity Manual*, 2000. Table 4.3-4 presents the applicable roadway segment LOS definitions for two-lane and multilane highway facilities.

Table 4.3-4
Roadway Segment Level of Service Criteria

Facility Type	Percent Time-Spent-Following (PTSF) (2-Lane) Passenger Cars per Hour per Lane (pc/hr/ln) (Multilane)				
	A	B	C	D	E
2-Lane, Class II Highway	≤ 40	> 40-55	> 55-70	> 70-85	> 85
Multilane Highway	490	810	1,170	1,550	1,900

Source: Highway Capacity Manual, 2000.

Peak-hour traffic signal warrant evaluation is consistent with the peak-hour volume warrant (Warrant 3B) methodologies noted in Section 4C of the *California Manual on Uniform Traffic Control Devices (CMUTCD)*, September 26, 2006.
The LOS analysis was conducted for the study intersections and roadway segments for weekday AM and PM peak-hours for the following scenarios:

- Existing (2008) Conditions (See the previous section for the results of the Existing Conditions scenario);
- Existing Plus Approved Projects Conditions;
- Existing Plus Approved Projects Plus Proposed Project Conditions;
- Cumulative (2030) Conditions; and
- Cumulative Plus Proposed Project Conditions.

Existing Plus Approved Projects Conditions

Peak-hour traffic associated with several development projects in the vicinity of the proposed project was added to the existing traffic volumes. These projects, which are in various stages of planning or development, are assumed to be developed and fully occupied prior to implementation of the proposed project. Project information for all approved projects to be included in this analysis was provided by the City. A summary of pending or approved projects that were determined to contribute traffic to the study facilities is provided below in Table 4.3-5.

Table 4.3-5
City of Brentwood Pending and Approved Projects

Project Name	Land Use Type	Size
Towncentre Commons	Residential	16 Multi-Family Units
Magnolia	Residential	34 Single-Family Units
Prewett Ranch	Residential	240 Single-Family Units
Delta Fence	Industrial	25,916 Square Feet
Brentwood Center II	Retail	8,800 Square Feet
Pizzagoni Towing	Industrial	67,458 Square Feet.
Office Condo Buildings	Office	37,776 Square Feet
Solid Waste Transfer Station	Industrial	32,962 Square Feet
Kendall Plaza	Mixed-Use	4,400 Square Feet Retail, 7,110 Square Feet Office 17,592 Square Feet Industrial

Source: City of Brentwood, Project Status Report, February 8, 2007.

Figure 4.3-5 provides the AM and PM peak-hour traffic volumes and intersections for the Existing Plus Approved Projects Scenario. Table 4.3-6 presents the peak-hour intersection operating conditions and signal warrants for the study intersections. As indicated in Table 4.3-6, the study intersection operations range from LOS A to LOS E during the AM and PM peak-hours. Table 4.3-7 presents roadway segment operating conditions for study roadway segments. As indicated in Table 4.3-7, the roadway segments operate at LOS A to LOS D.

Figure 4.3-5
Existing Plus Approved Projects Peak-Hour Traffic Volumes

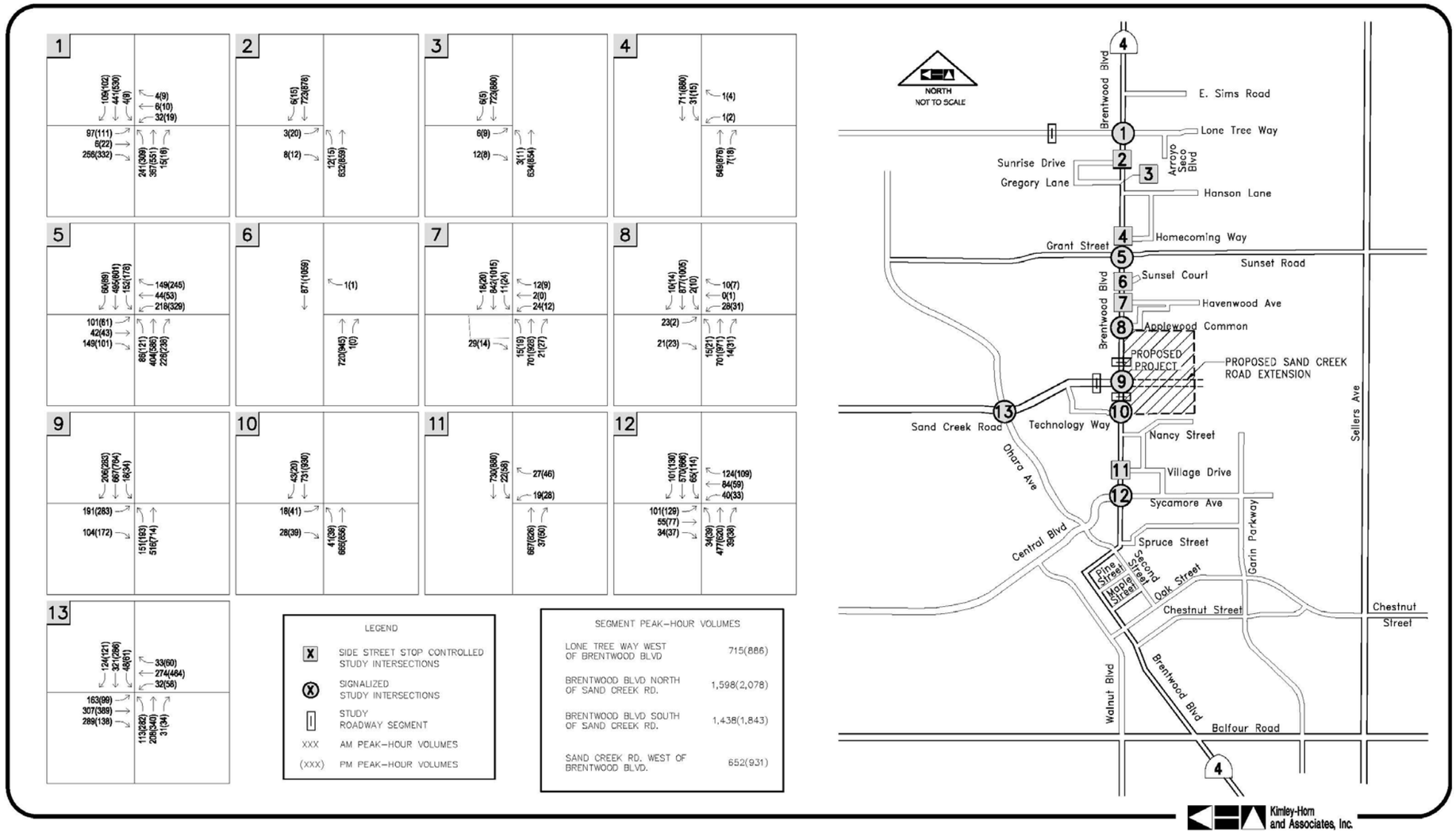


Table 4.3-6
Existing Plus Approved Projects Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec) or V/C Ratio[2]	LOS	Delay (sec) or V/C Ratio[2]	LOS	
1	Brentwood Blvd. @ Lone Tree Way	Signal	0.398	A	0.477	A	N/A
2	Brentwood Blvd. @ Sunrise Drive	SSSC	13.7	B	16.8	C	No
3	Brentwood Blvd. @ Gregory Lane	SSSC	13.8	B	16.1	C	No
4	Brentwood Blvd. @ Homecoming Way	SSSC	21.2	C	26.3	D	No
5	Brentwood Blvd. @ Grant Street/Sunset Road	Signal	0.663	B	0.810	D	N/A
6	Brentwood Blvd. @ Sunset Court	SSSC	13.4	B	16.3	C	No
7	Brentwood Blvd. @ Havenwood Avenue.	SSSC	28.9	D	37.8	E	No
8	Brentwood Blvd. @ Applewood Common	Signal	0.295	A	0.340	A	N/A
9	Brentwood Blvd. @ Sand Creek Road	Signal	0.453	A	0.581	A	N/A
10	Brentwood Blvd. @ Technology Way	Signal	0.276	A	0.345	A	N/A
11	Brentwood Blvd. @ Village Drive	SSSC	17.0	C	26.2	D	No
12	Brentwood Blvd. @ Central Blvd./Sycamore Avenue	Signal	0.336	A	0.379	A	N/A
13	Sand Creek Road @ O'Hara Avenue	Signal	0.337	A	0.458	A	N/A

[1] Per the California Manual on Uniform Traffic Control Devices (CMUTCD), Section 4C, September 26, 2006.
[2] Control delay for worst minor approach (worst minor movement) for TWSC.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Table 4.3-7
Existing Plus Approved Projects Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS	PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.[2]	Collector	2	65.7%	C	70.7%	D
2	Brentwood Blvd. north of Sand Creek Road[3]	Arterial	4	394/497	A/B	562/610	B/B
3	Brentwood Blvd. south of Sand Creek Road[3]	Arterial	4	361/417	A/A	523/539	B/B
4	Sand Creek Road west of Brentwood Blvd. [2]	Arterial	4	175/212	A/A	262/274	A/A

1 PTSF = Percent Time Spent Following Pc/Hr/Ln = passenger cars per hour per lane
2 Results for this roadway segment are presented in NB/SB format (where applicable).
3 Results for this roadway segment are presented in EB/WB format (where applicable).

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Proposed Project Trip Generation

The number of trips anticipated to be generated by the proposed project was derived using data included in *Trip Generation, 7th Edition*, and the *Trip Generation Handbook, Second Edition*, both published by the Institute of Transportation Engineers (ITE). Where applicable, the regression equation method was utilized for trip generation calculations, per the guidelines recommended by ITE.[4] The anticipated trip generation for the proposed project is shown in Table 4.3-8.

As shown in Table 4.3-8, the proposed project's land uses are estimated to generate 13,129 total new daily trips with 1,244 new trips occurring during the AM peak-hour, and 1,280 new trips occurring during the PM peak-hour.

Project Trip Distribution

The distribution of project generated traffic for Existing Plus Proposed Project Conditions was developed based on traffic data collected in October 2008 and general knowledge of project area traffic patterns. The project trip distribution percentages are assumed to be similar to those assumed for the Brentwood Boulevard Specific Plan[5] and are illustrated in Figure 4.3-6. The resulting AM and PM peak-hour traffic volumes attributed to the proposed project at the study area intersections are illustrated in Figure 4.3-7.

Project trips for the Cumulative Plus Proposed Project conditions were distributed using future year (2030) output from the CCTA travel demand model. The model employs a methodology that matches trip generators and trip attractors over a wide region, and includes the effects of the SR 4 Bypass and other planned infrastructure improvements.

Existing Plus Approved Projects Plus Proposed Project Conditions

Traffic associated with the proposed project was added to the Existing Plus Approved Projects traffic volumes to establish the Existing Plus Approved Projects Plus Proposed Project traffic conditions. Adding the proposed project to the street network results in a change in intersection lane geometry at several locations. These geometric changes are shown in Figure 4.3-8. Traffic volumes for the Existing Plus Approved Projects Plus Proposed Project scenario are presented in Figure 4.3-9.

Intersections

Table 4.3-9 presents the peak-hour intersection operating conditions for the study intersections. As indicated in Table 4.3-9, the study intersections operate from LOS A to LOS F during the AM and PM peak-hours.

Roadway Segments

Table 4.3-10 presents the roadway segment levels of service for the study roadway segments. As indicated in Table 4.3-10, the roadway segments operate at LOS A to LOS D.

Table 4.3-8
Proposed Project Trip Generation

ITE Land Use	Size[1]	Total Daily Trips	AM Peak-Hour Total Trips	AM IN %	AM IN Trips	AM OUT %	AM OUT Trips	PM Peak-Hour Total Trips	PM IN %	PM IN Trips	PM OUT %	PM OUT Trips
Apartment	468.0	2,963	233	20%	47	80%	186	275	65%	179	35%	96
Single-Family Detached Housing	148.0	1,491	113	25%	28	75%	85	153	63%	96	37%	56
Shopping Center	107.3	7,108	163	61%	100	39%	64	656	48%	315	52%	341
General Office Building	88.0	1,209	169	88%	149	12%	20	177	17%	30	83%	147
College	228.7	5,489	659	88%	580	12%	79	494	17%	84	83%	410
Subtotal New Trips		**18,260**	**1,337**		**903**		**434**	**1,755**		**704**		**1,051**
Internal Reduction[2] Daily PM	11.2% 10.3 %	-1,436						-129		-64		-66
Pass-By Reduction[2] (LU 820)	34%	-2,417						-223		-107		-116
Alternate Mode Reduction[3]	7%	-1,278	-94		-63		-30	-123		-49		-74
Net New External Trips		**13,129**	**1,244**		**840**		**404**			**484**		**796**

[1] Dwelling units for residential uses and square feet for non-residential uses.
[2] Based on methodology published in *Trip Generation Handbook, Second Edition*, ITE.
[3] Per the *Brentwood Boulevard Specific Plan ADEIR*.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Figure 4.3-6
Proposed Project Trip Distribution

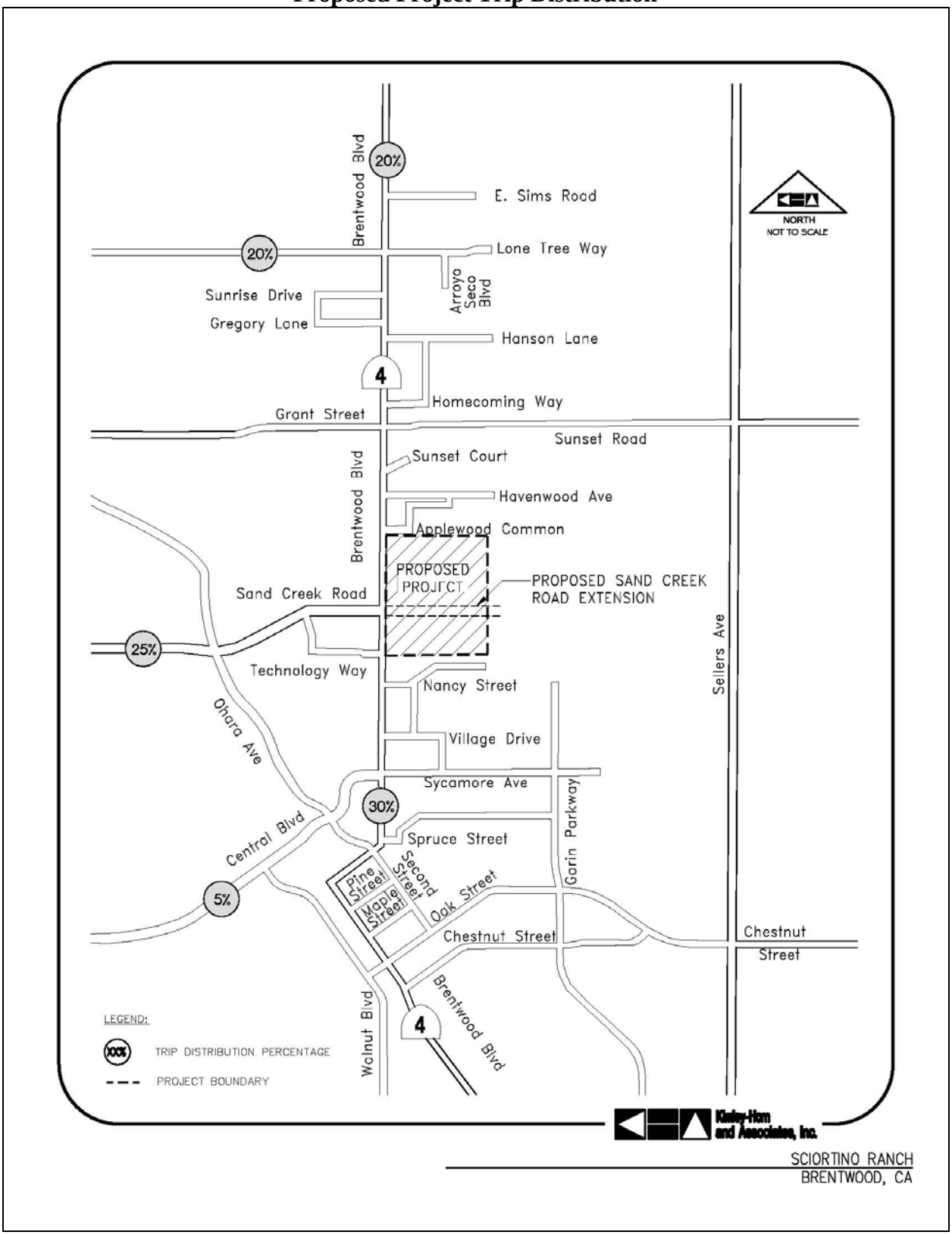


Figure 4.3-7
Proposed Project Trip Assignment

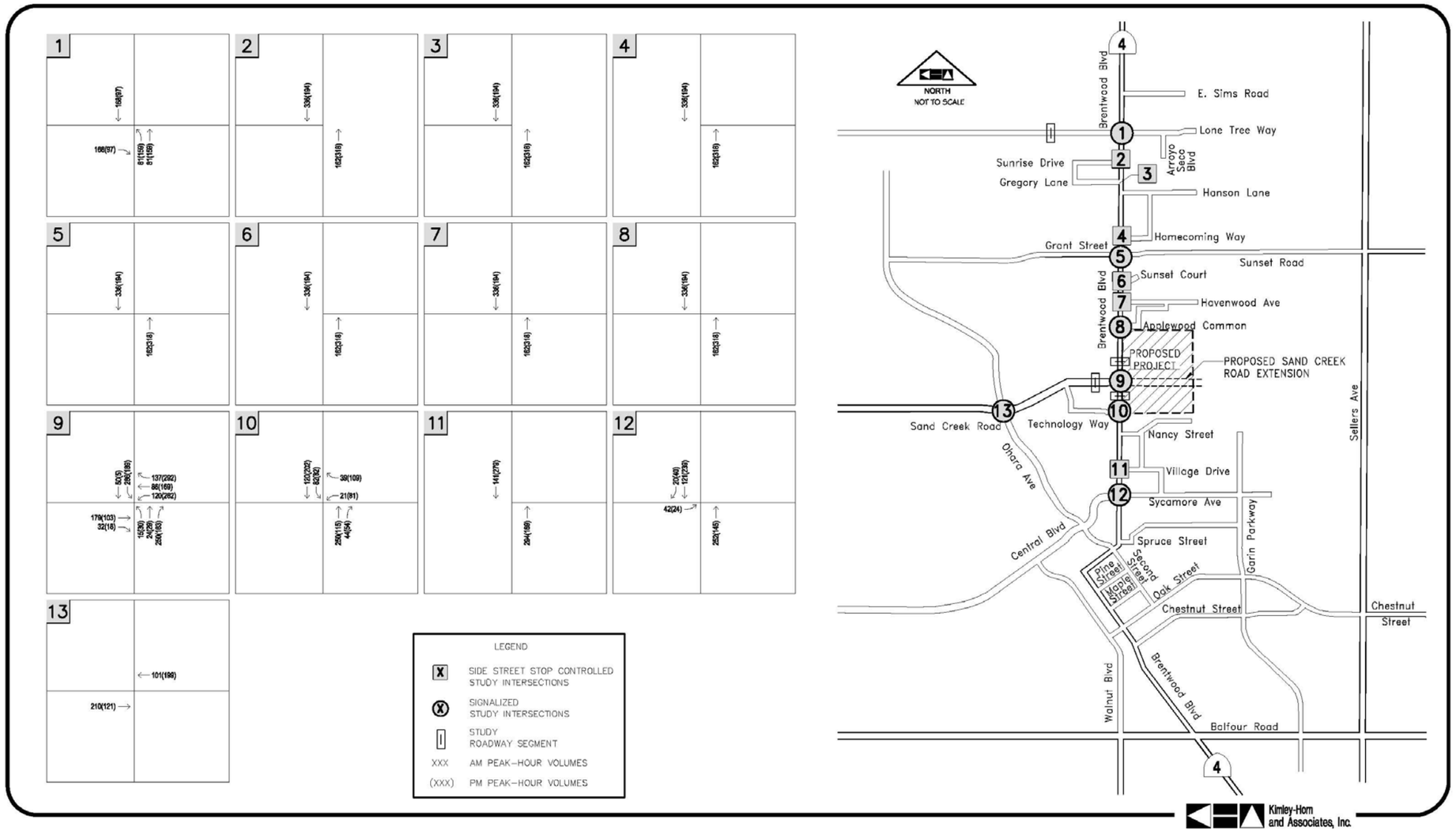


Figure 4.3-8
Existing Plus Approved Projects Plus Proposed Project Intersection Geometry and Traffic Control

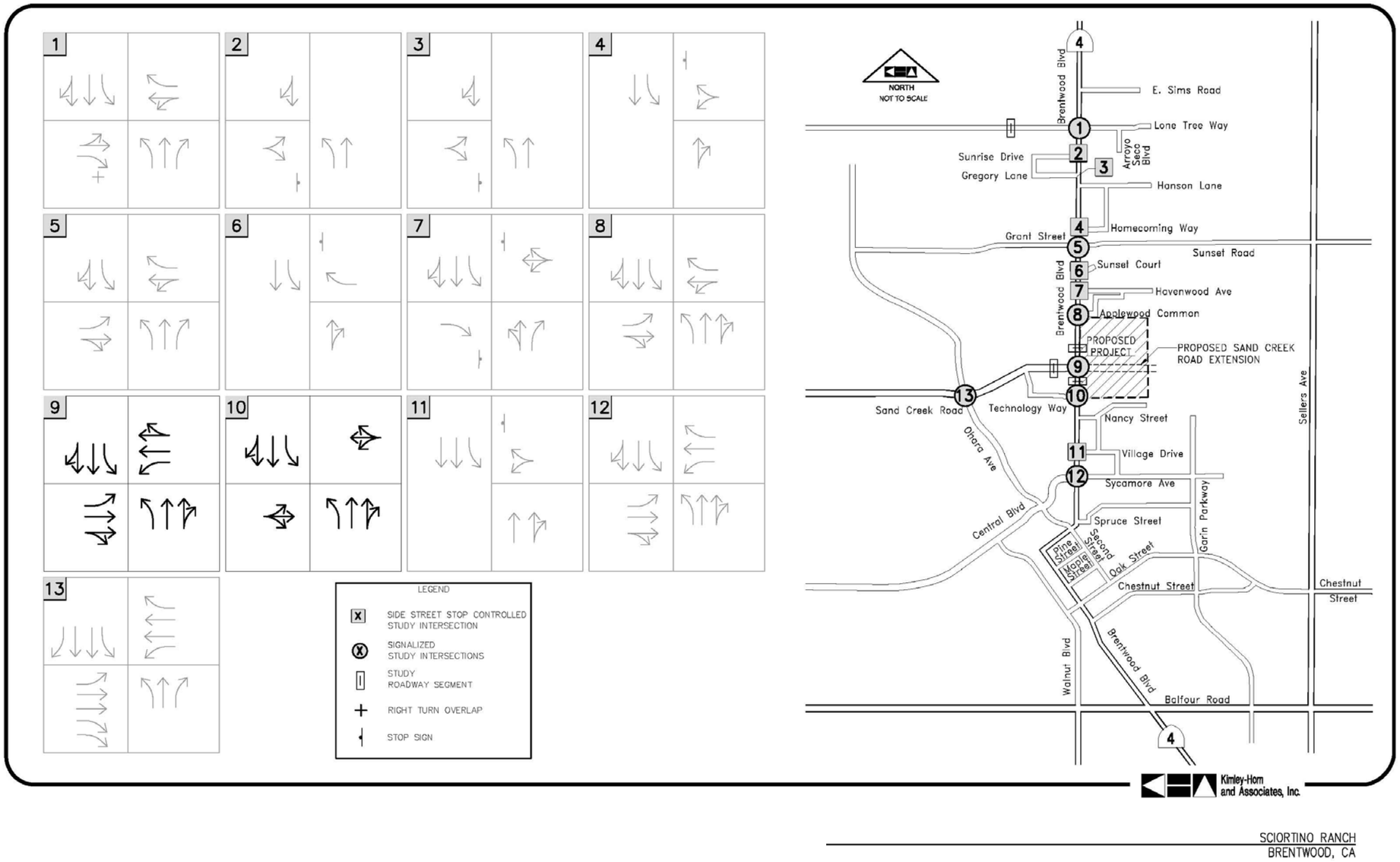


Figure 4.3-9
Existing Plus Approved Projects Plus Proposed Project Peak-Hour Traffic Volumes

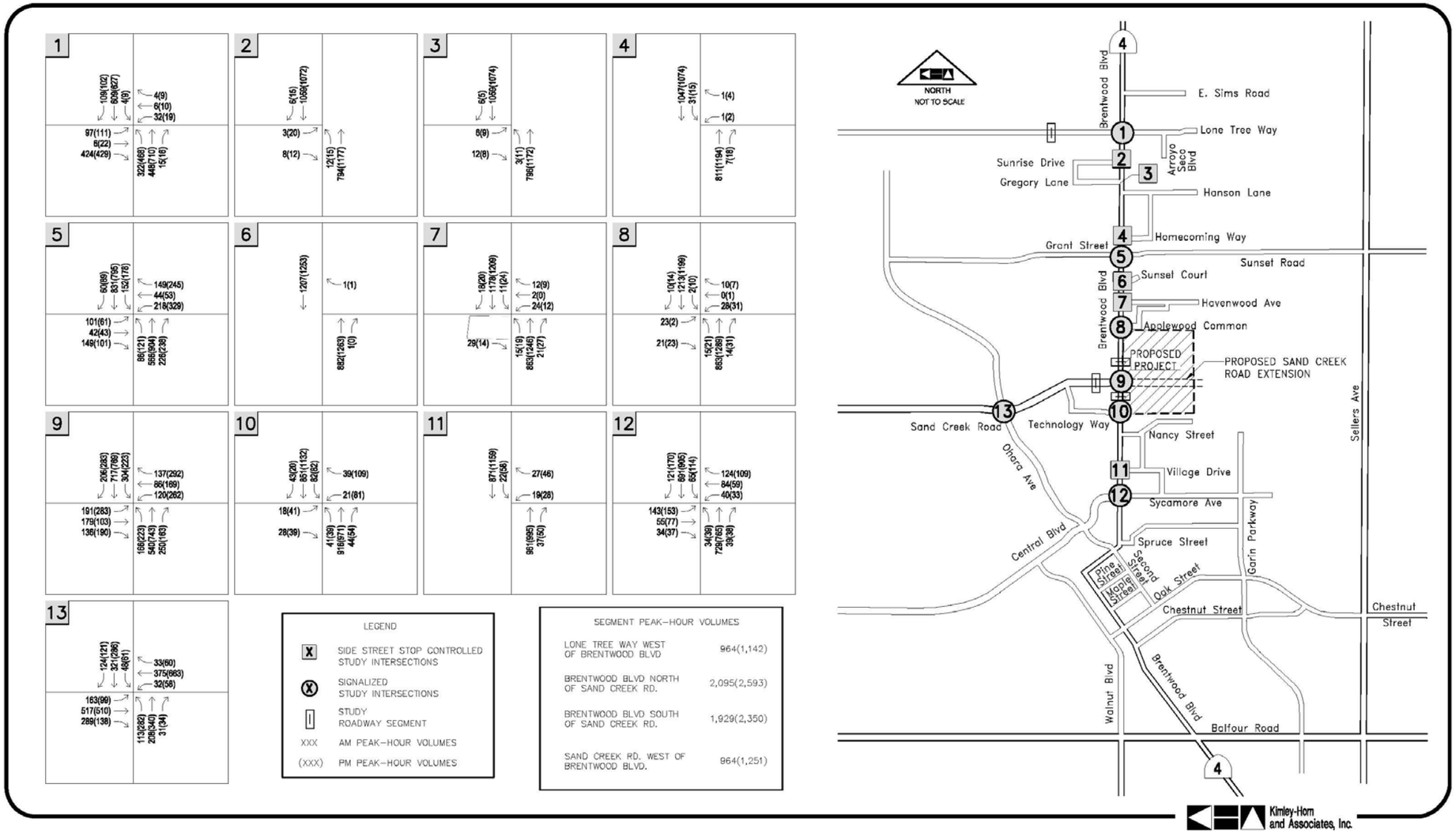


Table 4.3-9
Existing Plus Approved Projects Plus Proposed Project Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec) or V/C Ratio[2]	LOS	Delay (sec) or V/C Ratio[2]	LOS	
1	Brentwood Blvd. @ Lone Tree Way	Signal	0.498	A	0.603	B	N/A
2	Brentwood Blvd. @ Sunrise Drive	SSSC	18.3	C	21.4	C	No
3	Brentwood Blvd. @ Gregory Lane	SSSC	18.5	C	20.0	C	No
4	Brentwood Blvd. @ Homecoming Way	SSSC	35.1	E	47.0	E	No
5	Brentwood Blvd. @ Grant Street/Sunset Road	Signal	0.867	D	0.975	E	N/A
6	Brentwood Blvd. @ Sunset Court	SSSC	15.4	C	22.3	C	No
7	Brentwood Blvd. @ Havenwood Avenue.	SSSC	53.4	F	79.7	F	No
8	Brentwood Blvd. @ Applewood Common	Signal	0.393	A	0.421	A	N/A
9	Brentwood Blvd. @ Sand Creek Road	Signal	0.622	B	0.802	D	N/A
10	Brentwood Blvd. @ Technology Way	Signal	0.405	A	0.536	A	N/A
11	Brentwood Blvd. @ Village Drive	SSSC	25.9	D	44.2	E	No
12	Brentwood Blvd. @ Central Blvd./Sycamore Avenue	Signal	0.404	A	0.478	A	N/A
13	Sand Creek Road @ O'Hara Avenue	Signal	0.368	A	0.518	A	N/A

Note: Shaded cells indicate significant impact.

[1] Per the California Manual on Uniform Traffic Control Devices (CMUTCD), Section 4C, September 26, 2006.
[2] Control delay for worst minor approach (worst minor movement) for TWSC.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Table 4.3-10
Existing Plus Approved Projects Plus Proposed Project Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-hour		PM Peak-hour	
				PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS	PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.[2]	Collector	2	72.5%	D	76.5%	D
2	Brentwood Blvd. north of Sand Creek Road[3]	Arterial	4	485/685	A/B	743/719	B/B
3	Brentwood Blvd. south of Sand Creek Road[3]	Arterial	4	517/526	B/B	651/704	B/B
4	Sand Creek Road west of Brentwood Blvd. [2]	Arterial	4	301/273	A/A	332/389	A/A

Note: Shaded cells indicate significant impact.

1 PTSF = Percent Time Spent Following Pc/Hr/Ln = passenger cars per hour per lane
2 Results for this roadway segment are presented in NB/SB format (where applicable).
3 Results for this roadway segment are presented in EB/WB format (where applicable).

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Cumulative (2030) Conditions

Year 2030 AM and PM peak-hour roadway segment traffic volumes were obtained from the Brentwood Boulevard Specific Plan.[6] Those volumes assume that the Specific Plan land uses are incorporated into the CCTA Regional Travel Demand model. The model estimates vehicle traffic expected for buildout of the land uses designated in the General Plan. The model then assigns those traffic volumes to various roadway facilities anticipated to be in place prior to the year for which traffic is being forecasted. The SR 4 Bypass is assumed to be in place under cumulative conditions. To establish cumulative (no project) conditions, trips from land uses assumed for the project site in the Brentwood Boulevard Specific Plan were deducted from the network. The resulting volumes were then adjusted to not be less than the Existing Plus Approved Project conditions.

The City's General Plan designates a number of improvements for the project area as noted below. It is assumed that the following improvements will be implemented over time with the implementation of the General Plan:

- Widening of Brentwood Boulevard to four lanes; and
- Extension of Sand Creek Road east from Brentwood Boulevard to the easterly boundary of the Barrington subdivision.

Existing turning movement percentages were used to establish turning movement volumes for cumulative traffic conditions. In some cases, the use of existing turning movement percentages was not deemed appropriate due to anticipated roadway network changes. In such cases, traffic volumes were adjusted to reflect the probable effects on the circulation patterns in the vicinity of the proposed project. Traffic volumes for the Cumulative scenario are presented in Figure 4.3-10.

Intersections

Table 4.3-11 presents the peak-hour intersection operating conditions for the study intersections. As indicated in Table 4.3-11, the study intersections operate from LOS A to LOS F during the AM and PM peak-hours, under Cumulative conditions.

Roadway Segments

Table 4.3-12 presents the roadway segment levels of service for the study roadway segments. As indicated in Table 4.3-12, the roadway segments operate from LOS A to LOS E during the AM and PM peak-hours, under Cumulative conditions.

Figure 4.3-10
Cumulative (2030) Peak-Hour Traffic Volumes

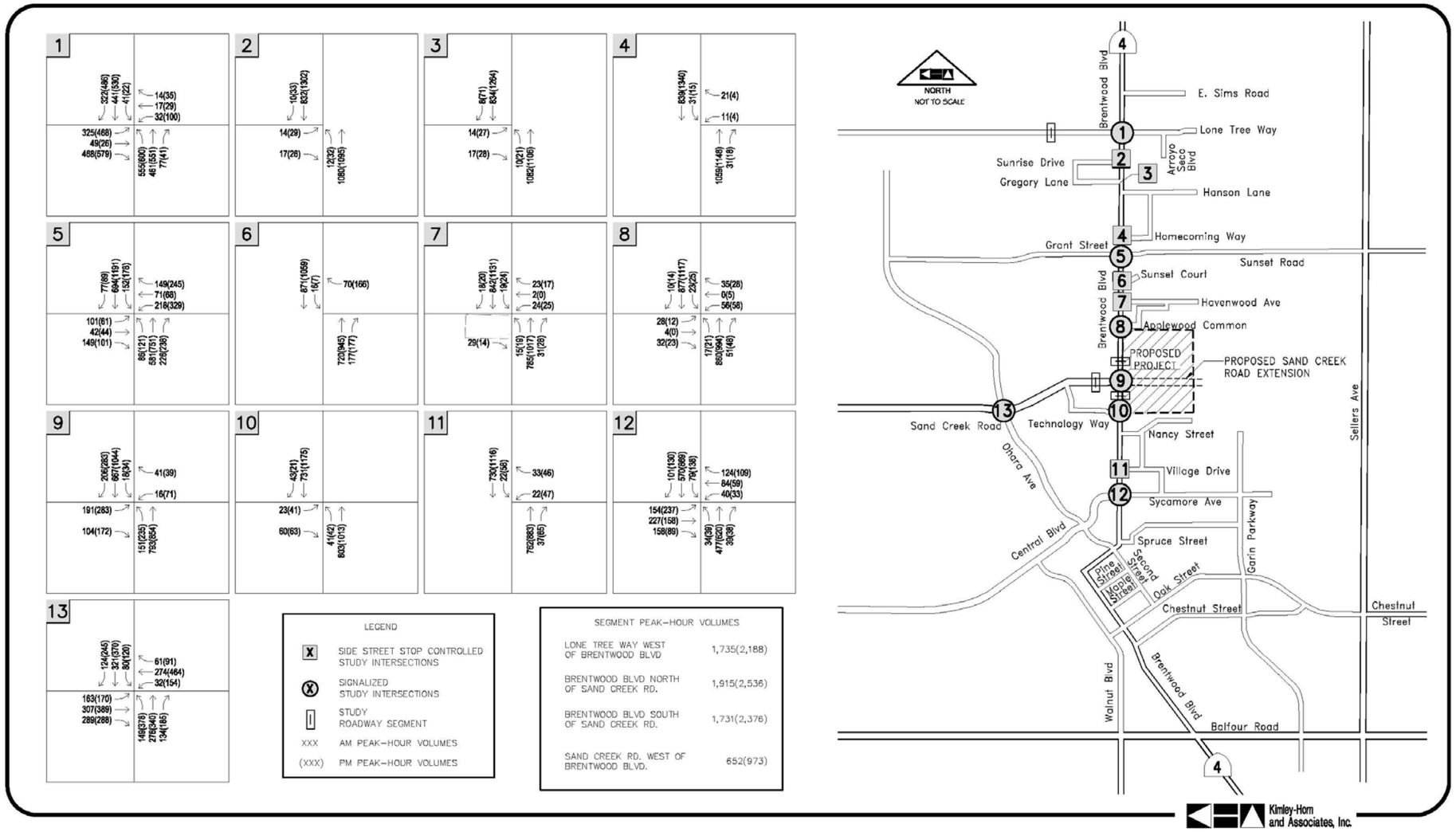


Table 4.3-11
Cumulative Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec) or V/C Ratio[2]	LOS	Delay (sec) or V/C Ratio[2]	LOS	
1	Brentwood Blvd. @ Lone Tree Way	Signal	0.824	D	1.049	F	N/A
2	Brentwood Blvd. @ Sunrise Drive	SSSC	17.1	C	29.0	D	No
3	Brentwood Blvd. @ Gregory Lane	SSSC	17.1	C	28.3	D	No
4	Brentwood Blvd. @ Homecoming Way	SSSC	40.9	E	83.1	F	No
5	Brentwood Blvd. @ Grant Street/Sunset Road	Signal	0.810	D	1.178	F	N/A
6	Brentwood Blvd. @ Sunset Court	SSSC	16.5	C	33.9	D	No
7	Brentwood Blvd. @ Havenwood Avenue.	SSSC	31.2	E	63.4	F	No
8	Brentwood Blvd. @ Applewood Common	Signal	0.332	A	0.385	A	N/A
9	Brentwood Blvd. @ Sand Creek Road	Signal	0.497	A	0.74	C	N/A
10	Brentwood Blvd. @ Technology Way	Signal	0.297	A	0.433	A	N/A
11	Brentwood Blvd. @ Village Drive	SSSC	19.0	C	55.2	F	No
12	Brentwood Blvd. @ Central Blvd./Sycamore Avenue	Signal	0.365	A	0.506	A	N/A
13	Sand Creek Road @ O'Hara Avenue	Signal	0.398	A	0.585	A	N/A

[1] Per the California Manual on Uniform Traffic Control Devices (CMUTCD), Section 4C, September 26, 2006.
[2] Control delay for worst minor approach (worst minor movement) for TWSC.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Table 4.3-12
Cumulative Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-hour		PM Peak-hour	
				PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS	PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.[2]	Collector	2	86.2%	E	91.0%	E
2	Brentwood Blvd. north of Sand Creek Road[3]	Arterial	4	571/497	B/B	663/768	B/B
3	Brentwood Blvd. south of Sand Creek Road[3]	Arterial	4	510/425	B/A	628/742	B/B
4	Sand Creek Road west of Brentwood Blvd. [2]	Arterial	4	175/212	A/A	262/298	A/A

1 PTSF = Percent Time Spent Following Pc/Hr/Ln = passenger cars per hour per lane
2 Results for this roadway segment are presented in NB/SB format (where applicable).
3 Results for this roadway segment are presented in EB/WB format (where applicable).

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Cumulative (2030) Plus Proposed Project

The Cumulative (2030) traffic volumes include buildout of the proposed project site with the land uses specified in the Brentwood Boulevard Specific Plan (BBSP). Therefore, for the Cumulative Plus Proposed Project scenario, trips for the site associated with the BBSP land uses were first removed from the network. The project trips were then added to the network to establish Cumulative Plus Proposed Project conditions. Traffic volumes for this scenario are presented in Figure 4.3-11.

Intersections

Table 4.3-13 presents the peak-hour intersection operating conditions for the study intersections. As indicated in Table 4.3-13, the study intersections operate from LOS A to LOS F during the AM and PM peak-hours, under Cumulative Plus Proposed Project conditions.

Roadway Segments

Table 4.3-14 presents the roadway segment levels of service for the study roadway segments. As indicated in Table 4.3-14, the roadway segments operate at LOS A to LOS E, under Cumulative Plus Proposed Project conditions.

Project-Level Impacts and Mitigation Measures

Only intersections and roadway segments that are forecast to operate at unacceptable LOS with implementation of the proposed project are discussed in the Project-Level Impacts and Mitigation Measures section.

In regard to the following mitigation measures, it should be noted that future project applicants within the Brentwood Boulevard Specific Plan boundaries will be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. In addition, project-specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

4.3-1 Impacts to the unsignalized intersection of Brentwood Boulevard and Homecoming Way.

As shown in Table 4.3-9, the addition of the trips generated by the proposed project would result in deterioration of LOS at the intersection of Brentwood Boulevard and Homecoming Way from LOS C to LOS E during the AM peak-hour and from LOS D to LOS E during the PM peak-hour. Therefore, the development of the proposed project would result in a ***potentially significant*** impact to the intersection of Brentwood Boulevard and Homecoming Way.

Figure 4.3-11
Cumulative (2030) Plus Proposed Project Peak-Hour Traffic Volumes

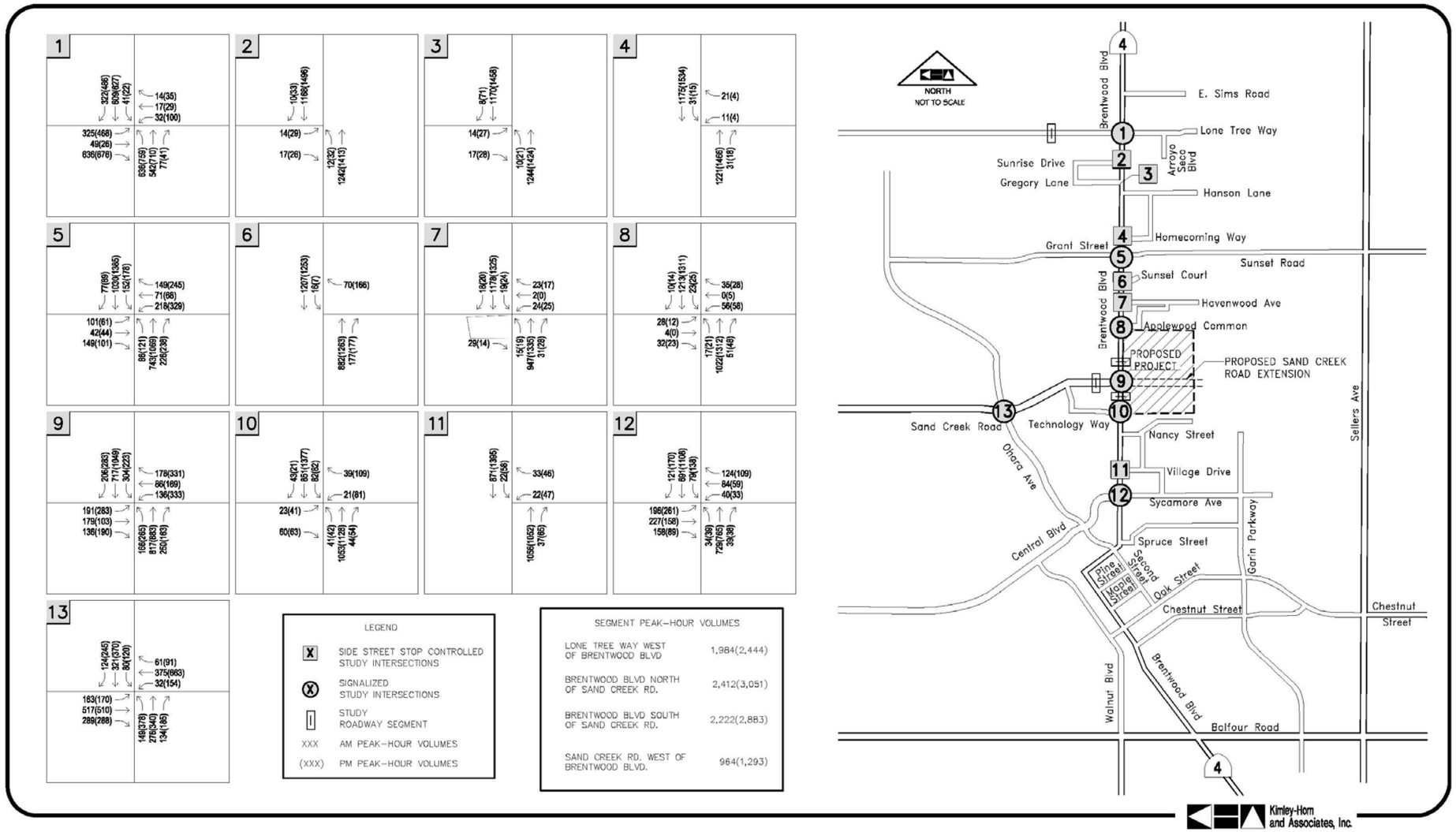


Table 4.3-13
Cumulative Plus Proposed Project Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec) or V/C Ratio[2]	LOS	Delay (sec) or V/C Ratio[2]	LOS	
1	Brentwood Blvd. @ Lone Tree Way	Signal	0.924	E	1.175	F	N/A
2	Brentwood Blvd. @ Sunrise Drive	SSSC	23.1	C	40.8	E	No
3	Brentwood Blvd. @ Gregory Lane	SSSC	23.0	C	39.5	E	No
4	Brentwood Blvd. @ Homecoming Way	SSSC	88.7	F	197.6	F	No
5	Brentwood Blvd. @ Grant Street/Sunset Road	Signal	1.014	F	1.295	F	N/A
6	Brentwood Blvd. @ Sunset Court	SSSC	20.0	C	92.2	F	**YES**
7	Brentwood Blvd. @ Havenwood Avenue.	SSSC	60.1	F	192.1	F	No
8	Brentwood Blvd. @ Applewood Common	Signal	0.419	A	0.453	A	N/A
9	Brentwood Blvd. @ Sand Creek Road	Signal	0.731	C	0.936	E	N/A
10	Brentwood Blvd. @ Technology Way	Signal	0.469	A	0.627	B	N/A
11	Brentwood Blvd. @ Village Drive	SSSC	30.4	D	139.9	F	No
12	Brentwood Blvd. @ Central Blvd./Sycamore Avenue	Signal	0.4	A	0.605	B	N/A
13	Sand Creek Road @ O'Hara Avenue	Signal	0.428	A	0.645	B	N/A

Note: Shaded cells indicate significant impact.

[1] Per the California Manual on Uniform Traffic Control Devices (CMUTCD), Section 4C, September 26, 2006.
[2] Control delay for worst minor approach (worst minor movement) for TWSC.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Table 4.3-14
Cumulative Plus Proposed Project Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-hour		PM Peak-hour	
				PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS	PTSF (2 Lane) pc/hr/ln (4 Lane)[1]	LOS
1	Lone Tree Way west of Brentwood Blvd.[2]	Collector	2	89.1%	E	92.8%	E
2	Brentwood Blvd. north of Sand Creek Road[3]	Arterial	4	662/685	B/B	844/877	C/C
3	Brentwood Blvd. south of Sand Creek Road[3]	Arterial	4	667/535	B/B	756/906	B/C
4	Sand Creek Road west of Brentwood Blvd. [2]	Arterial	4	301/273	A/A	332/413	A/A

1 PTSF = Percent Time Spent Following Pc/Hr/Ln = passenger cars per hour per lane
2 Results for this roadway segment are presented in NB/SB format (where applicable).
3 Results for this roadway segment are presented in EB/WB format (where applicable).

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Mitigation Measure(s)
As shown in Table 4.3-15, implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level. Figure 4.3-12 illustrates the required lane modification.

4.3-1 *The Brentwood Boulevard / Homecoming Way intersection shall be modified by eliminating left turns from the intersection's westbound approach, to the satisfaction of the City Engineer. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.*

4.3-2 Impacts to the signalized intersection of Brentwood Boulevard and Grant Street / Sunset Road.

As shown in Table 4.3-9, the addition of the trips generated by the proposed project would result in deterioration of LOS at the intersection of Brentwood Boulevard and Grant Street / Sunset Road from LOS B to LOS D (greater than 0.85 v/c ratio) during the AM peak-hour and from LOS D to LOS E during the PM peak-hour. Therefore, the development of the proposed project would result in a ***potentially significant*** impact to the intersection of Brentwood Boulevard and Grant Street / Sunset Road.

Mitigation Measure(s)
As shown in Table 4.3-15, implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level. Figure 4.3-12 illustrates the required lane modifications.

4.3-2 *The Brentwood Boulevard / Grant Street / Sunset Road intersection shall be modified by converting the northbound right-turn lane into a through-right lane and adding a southbound through lane. If the modification is not already completed by others, then the developer shall be responsible for completing it prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. If the modification is completed prior to any development of the site, then the developer shall pay the project's fair share, with each building permit, through the transportation impact fee. The modification shall be completed to the satisfaction of the City Engineer.*

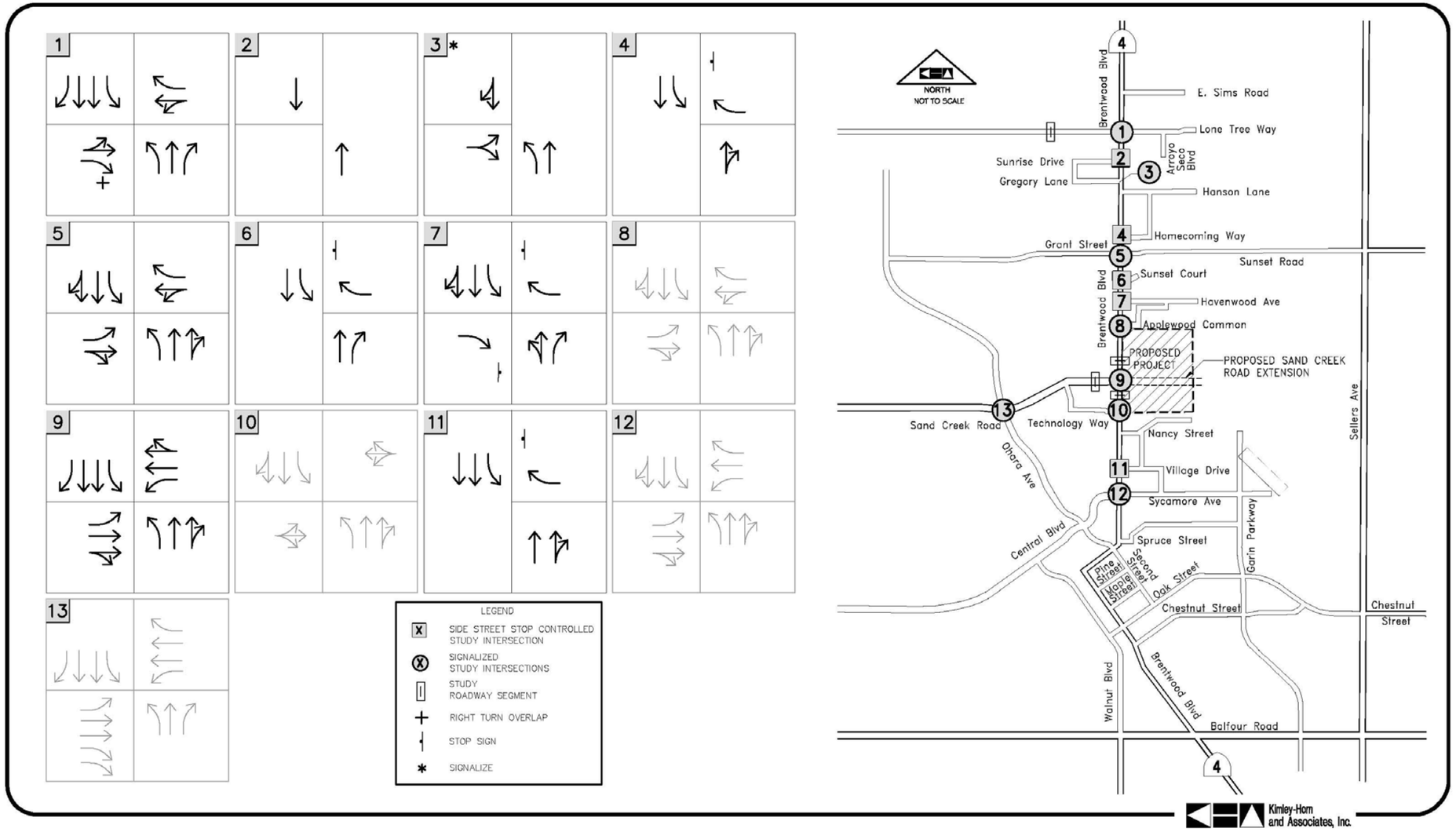
Table 4.3-15
Existing Plus Approved Projects Plus Proposed Project Mitigated Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour	
			Delay (sec) or V/C Ratio[1]	LOS	Delay (sec) or V/C Ratio[1]	LOS
1	Brentwood Blvd. @ Lone Tree Way	Signal				
2	Brentwood Blvd. @ Sunrise Drive	SSSC				
3	Brentwood Blvd. @ Gregory Lane	SSSC				
4	Brentwood Blvd. @ Homecoming Way	SSSC	14.5	B	21.3	C
5	Brentwood Blvd. @ Grant Street/Sunset Road	Signal	0.607	B	0.773	C
6	Brentwood Blvd. @ Sunset Court	SSSC				
7	Brentwood Blvd. @ Havenwood Avenue.	SSSC	16.3	C		
8	Brentwood Blvd. @ Applewood Common	Signal				
9	Brentwood Blvd. @ Sand Creek Road	Signal				
10	Brentwood Blvd. @ Technology Way	Signal				
11	Brentwood Blvd. @ Village Drive	SSSC			12.9	B
12	Brentwood Blvd. @ Central Blvd./Sycamore Avenue	Signal				
13	Sand Creek Road @ O'Hara Avenue	Signal				

Note: Shaded cells indicate that mitigation is not required.
[1] Control delay for worst minor approach (worst minor movement) for TWSC.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

Figure 4.3-12
Lane Geometries with Mitigation



4.3-3 Impacts to the unsignalized intersection of Brentwood Boulevard and Havenwood Avenue.

As shown in Table 4.3-9, the addition of the trips generated by the proposed project would result in deterioration of LOS at the intersection of Brentwood Boulevard and Havenwood Avenue from LOS D to LOS F during the AM peak-hour. Therefore, the development of the proposed project would result in a ***potentially significant*** impact to the intersection of Brentwood Boulevard and Havenwood Avenue.

Mitigation Measure(s)
As shown in Table 4.3-15, implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level. Figure 4.3-12 illustrates the required lane modification.

4.3-3 *The Brentwood Boulevard / Havenwood Avenue intersection shall be modified by eliminating through and left-turn movements from the intersection's westbound approach, to the satisfaction of the City Engineer. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.*

4.3-4 Impacts to the unsignalized intersection of Brentwood Boulevard and Village Drive.

As shown in Table 4.3-9, the addition of the trips generated by the proposed project would result in deterioration of LOS at the intersection of Brentwood Boulevard and Village Drive from LOS D to LOS E during the PM peak-hour. Therefore, the development of the proposed project would result in a ***potentially significant*** impact to the intersection of Brentwood Boulevard and Village Drive.

Mitigation Measure(s)
As shown in Table 4.3-15, implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level. Figure 4.3-12 illustrates the required lane modification.

4.3-4 *The Brentwood Boulevard / Village Drive intersection shall be modified by eliminating left turns from the intersection's westbound approach, to the satisfaction of the City Engineer. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit,*

then the proposed project shall include installation of the improvement and be eligible for reimbursement.

4.3-5 Impacts to bicycle and pedestrian facilities.

The City of Brentwood General Plan states, "as roadways are widened and improved, the City is requiring designs incorporating six to eight-foot wide bike lanes […] Sidewalks are part of the City's standard plans for arterial, collector, and local streets." Buildout of the proposed project is not expected to conflict with existing or planned bicycle or pedestrian facilities, and the project would conform to the City's requirements that would accomplish the above-mentioned goals regarding the implementation of bicycle and pedestrian facilities. As a result, impacts to bicycle and pedestrian facilities would be expected to be ***less-than-significant.***

Mitigation Measure(s)
None required.

4.3-6 Impacts to transit facilities.

Tri Delta Transit, which serves the Brentwood Area, has published a short range transit plan that provides information regarding ridership trends for bus routes.[7] The short-range plan indicates Route 391, which runs along Brentwood Boulevard has an average of 15.8 passengers per revenue hour and runs on 30-minute headways during the peak-hour. Similarly, Route 300, which is an express route, has an average ridership of 9.8 passengers per revenue hour and operates on 20-minute headways. The analysis for the proposed project assumes that buses operating on these routes have a seating capacity of 39 passengers.

As noted for the Existing Plus Approved Projects Plus Proposed Project scenario, transit ridership is currently significantly below capacity and would contain adequate service to support the development of the proposed project in the short-term. In addition, it is anticipated the adjustments to service will be based on ridership trends, including those in the project area. As a result, the impact of the project on transit services is expected to be ***less-than-significant***.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

The following impact discussion pertains to cumulative impacts associated with the Sciortino Ranch project.

4.3-7 Cumulative impacts to study intersections.

The Cumulative analysis was based on 2030 CCTA Regional Travel Demand Model, which includes buildout of the Brentwood General Plan, as well as development within Contra Costa County. Based on the analysis documented in the traffic report prepared for the proposed project, the proposed project would be expected to generate 13,129 new daily trips, including 1,244 new AM peak-hour trips and 1,280 new PM peak-hour trips. The addition of the proposed project to the Existing Plus Approved Projects scenario results in a significant impact at five study intersections. As shown in Table 4.3-16, the impacts at these intersections would be reduced to less-than-significant levels through the implementation of the project-level mitigation measures included in this EIR.

The proposed project would add traffic to study intersections and cause significant impacts for cumulative conditions at the following intersections:

- Brentwood Boulevard at Lone Tree Way (increases v/c ratio from 0.824 during the AM peak hour and 1.049 during the PM peak hour to 0.924 and 1.175, respectively);
- Brentwood Boulevard at Sunrise Drive (increases v/c ratio from 29.0 to 40.8 during the PM peak hour);
- Brentwood Boulevard at Gregory Lane (increases v/c ratio from 28.3 to 39.5 during the PM peak hour);
- Brentwood Boulevard at Grant Street / Sunset Road (increases v/c ratio from 0.810 during the AM peak hour and 1.178 during the PM peak hour to 1.014 and 1.295, respectively); and
- Brentwood Boulevard at Sand Creek Road (increases v/c ratio from 0.74 to 0.936 during the PM peak hour).

The proposed project would cause traffic operations at the above-listed intersections to drop from LOS C or better to LOS D or worse and/or cause the v/c ratio to increase by more than 0.01. Therefore, implementation of the proposed project would result in ***potentially significant*** cumulative impacts.

<u>Mitigation Measure(s)</u>
Implementation of the following mitigation measures would reduce the above cumulative impacts to a *less-than-significant* level. Figure 4.3-12 illustrates the required lane modifications.

Table 4.3-16
Cumulative (2030) Plus Proposed Project Mitigated Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour	
			Delay (sec) or V/C Ratio[1]	LOS	Delay (sec) or V/C Ratio[1]	LOS
1	Brentwood Blvd. @ Lone Tree Way	Signal	0.826	D	1.028	F
2	Brentwood Blvd. @ Sunrise Drive	SSSC			0.0	A
3	Brentwood Blvd. @ Gregory Lane	SSSC			13.6	B
4	Brentwood Blvd. @ Homecoming Way	SSSC				
5	Brentwood Blvd. @ Grant Street/Sunset Road	Signal	0.678	B	0.848	D
6	Brentwood Blvd. @ Sunset Court	SSSC				
7	Brentwood Blvd. @ Havenwood Avenue.	SSSC				
8	Brentwood Blvd. @ Applewood Common	Signal				
9	Brentwood Blvd. @ Sand Creek Road	Signal			0.851	D
10	Brentwood Blvd. @ Technology Way	Signal				
11	Brentwood Blvd. @ Village Drive	SSSC				
12	Brentwood Blvd. @ Central Blvd./Sycamore Avenue	Signal				
13	Sand Creek Road @ O'Hara Avenue	Signal				

Note: Shaded cells indicate that mitigation is not required.
[1] Control delay for worst minor approach (worst minor movement) for TWSC.

Source: Sciortino Ranch Traffic Impact Analysis, Kimley-Horn and Associates, Inc., January 30, 2009.

4.3-7(a) *The Brentwood Boulevard / Lone Tree Way intersection shall be modified by converting the southbound through-right lane to a through lane and adding a dedicated right-turn lane. If the modification is not already completed by others, then the developer shall be responsible for completing it prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. If the modification is completed prior to any development of the site, then the developer shall pay the project's fair share, with each building permit, through the transportation impact fee. The modification shall be completed to the satisfaction of the City Engineer.*

4.3-7(b) *The Brentwood Boulevard / Sunrise Drive intersection shall be modified by eliminating all left- and right-turn movements at the intersection. This improvement is not currently included in the City's CIP. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.*

4.3-7(c) *The Brentwood Boulevard / Gregory Lane intersection shall be modified by installation of a traffic signal for the intersection. The traffic signal shall be designed to include the Brentwood Boulevard / Beverly Place intersection. This improvement is not currently included in the City's CIP. If the improvement is included in the City's CIP upon issuance of the project's first building permit, then the project shall contribute to the mitigation by paying its fair share of the cost through the payment of the City's Transportation Impact Fee with the issuance of each building permit. In the event the improvement has not been added to the City's CIP upon issuance of the first building permit, then the proposed project shall include installation of the improvement and be eligible for reimbursement.*

4.3-7(d) *The Brentwood Boulevard / Grant Street / Sunset Road intersection shall be modified by converting the northbound right-turn lane into a through-right lane and adding a southbound through lane. If the modification is not already completed by others, then the developer shall be responsible for completing it prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. If the modification is completed prior to any development of the site, then the developer shall pay the project's fair share, with each building permit, through the transportation impact fee. The modification shall be completed to the satisfaction of the City Engineer.*

4.3-7(e) *The Brentwood Boulevard / Sand Creek Road intersection shall be modified by converting the southbound through-right lane to a through lane and adding a southbound right turn lane. The developer shall complete the modification prior to issuance of the first residential building permit and/or prior to issuance of a Certificate of Occupancy for the first non-residential building permit. The modification shall be completed to the satisfaction of the City Engineer.*

Endnotes

[1] Kimley-Horn and Associates Inc. *Sciortino Ranch Traffic Impact Analysis*. January 30, 2009.
[2] City of Brentwood. *General Plan Update, Circulation Element.* Amended through January 2006.
[3] Contra Costa Transportation Authority. *East County Action Plan*. June 29, 2000.
[4] Institute of Transportation Engineers. *Trip Generation Handbook, Second Edition*. January 2004.
[5] Kimley-Horn and Associates, Inc. *Traffic Impact Analysis, Brentwood Boulevard Specific Plan, Final Report*. April 14, 2008.
[6] Ibid.
[7] Eastern Contra Costa Transit Authority. *Tri Delta Transit Short Range Transit Plan FY 2005-2015, Final*. January 2006.

4.4 AIR QUALITY AND CLIMATE CHANGE

4.4 AIR QUALITY AND CLIMATE CHANGE

Introduction

The Air Quality chapter describes the effects of the proposed project on local and regional air quality. The chapter includes a discussion of the existing air quality, construction-related air quality impacts resulting from grading and equipment emissions, direct and indirect emissions associated with the project, the impacts of these emissions on both the local and regional scale, and mitigation measures warranted to reduce or eliminate any identified significant impacts. In addition, the Air Quality chapter includes a discussion of Global Climate Change and the proposed project's contribution to greenhouse gas (GHG) emissions. The analysis in this chapter does not attempt to quantify the specific cumulative contribution of the project to Global Climate Change; rather, the chapter provides a qualitative assessment of the issue as related to the proposed project. This chapter is based on the *City of Brentwood General Plan Update*,[1] the *City of Brentwood General Plan Update EIR*,[2] and the *Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines*.[3]

Existing Environmental Setting

The following setting information provides an overview of the air basin and existing air quality in the City of Brentwood.

Air Basin Characteristics

The City of Brentwood is located on the south side of the San Joaquin River delta, east of the Carquinez Strait. Brentwood's location between the greater Bay Area and the Central Valley is greatly influenced by the climate and air quality of the two areas. Brentwood is located at the eastern boundary of the nine-county San Francisco Bay Area Air Basin. Brentwood is also a few miles west of San Joaquin County, which is part of the eight-county San Joaquin Valley Air Basin (SJVAB).

Brentwood has a relatively low potential for air pollution, given the persistent and strong winds typical of the area. Wind records from the closest wind-measuring sites show a strong predominance of westerly winds. Average wind speed is relatively high and the frequency of calm winds is low. The winds dilute pollutants and transport them away from the area, so that emissions released in the project area have more influence on air quality in the Sacramento and San Joaquin Valleys than locally. However, several major stationary sources currently exist in upwind cities that influence local air quality. In addition, the proposed project's location, downwind of the greater Bay Area, causes airborne pollutants to be transported to the area. It should be noted that although a natural gas well exists on the northeastern portion of the project site, the applicant has indicated that removal of the gas well is not part of the project. The well would, however, be removed prior to any development at the well site. Removal of the well

requires a well abandonment permit from the Contra Costa County Environmental Health Department, and a licensed contractor must perform the work. Therefore, the well is not expected to produce any impacts to air quality in the vicinity of the site.

Ambient Air Quality Standards

Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards for each contaminant represent safe levels that avoid specific adverse health effects. Pollutants for which air quality standards have been established are called "criteria" pollutants. Table 4.4-1 identifies the major pollutants, characteristics, health effects and typical emission sources. The federal and California ambient air quality standards are summarized in Table 4.4-2.

The federal and State ambient standards were developed independently with differing purposes and methods. As a result, the federal and State standards differ in some cases. In general, the State of California standards are more stringent than the federal standards, particularly for ozone and particulate matter.

The State of California regularly reviews scientific literature regarding the health effects and exposure to particulate matter and other pollutants. On May 3, 2002, the CARB staff recommended lowering the level of the annual standard for PM_{10} (particulate matter 10 micrometers in diameter and smaller) and establishing a new annual standard for $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller). The new standards became effective on July 5, 2003. In early 2006, a new 8-hour standard for ozone (0.07 parts per million [ppm]) went into effect, and on February 19, 2007 new standards for nitrogen oxide (NO_X) emissions were established and became effective March 20, 2008.

<u>Ozone</u>

Ozone is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere. The creation of ozone is a result of a complex chemical reaction between reactive organic gases (ROG) and NO_X gases in the presence of sunshine. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources. Factories, automobiles, and evaporation of solvents and fuels are the major sources of ozone precursors. The health effects of ozone are difficulty breathing, lung tissue damage, and eye irritation.

Table 4.4-1
Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Examples of Sources
Ozone	A strong smelling, pale blue, reactive toxic chemical gas consisting of three oxygen atoms. Ozone exists in the upper atmosphere ozone layer (stratospheric ozone) as well as at the Earth's surface in the troposphere (ozone). Ozone in the troposphere causes numerous adverse health effects and is a criteria air pollutant, and is a major component of smog.	• Breathing difficulties • Lung tissue damage • Damage to rubber and some plastics • Eye and skin irritation	Formed when reactive organic gases (ROG) and nitrogen oxides react in the presence of sunlight. ROG and NO_X sources include any source that burns fuels, (e.g., gasoline, natural gas, wood, oil) solvents, petroleum processing and storage and pesticides.
Carbon Monoxide	A colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels. Over 80 percent of the carbon monoxide emitted in urban areas is contributed by motor vehicles.	• Chest pain in heart patients • Headaches and nausea • Reduced mental alertness • High concentration can result in death	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.
Nitrogen Oxides (NO_X)	A general term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO_2) and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes, and are major contributors to smog formation and acid deposition. NO_2 is a criteria air pollutant, and may result in numerous adverse health effects.	• Lung irritation and damage • Reacts in the atmosphere to form ozone and acid rain	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.
Sulfur Oxides/Sulfates (SO_X)	Pungent, colorless gases (sulfates are solids) formed primarily by the combustion of sulfur-containing fossil fuels, especially coal and oil. Considered major air pollutants, sulfur oxides may impact human health and damage vegetation.	• Increased lung disease and breathing problems for asthmatics • Reacts in the atmosphere to form acid rain	Coal or oil burning power plants and industries, refineries, and diesel engines.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Any material, except pure water, that exists in the solid or liquid state in the atmosphere. The size of particulate matter can vary from coarse, wind-blown dust particles to fine particle combustion products.	• Increased respiratory disease • Lung damage • Premature death • Reduced visibility	Fuel combustion in motor vehicles, equipment and industrial sources, residential and agricultural burning. Particulate matter is also formed from reaction of other pollutants (acid rain, NO_X, SO_X, organics).

Source: http://www.arb.ca.gov/html/gloss.htm, November 2008.

Table 4.4-2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary	Secondary
Ozone	1 Hour	0.09 ppm	-	Same as primary
Ozone	8 Hour	0.07 ppm	0.075 ppm	Same as primary
Carbon Monoxide	8 Hour	9 ppm	9 ppm	None
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Average	0.03 ppm	0.053 ppm	Same as primary
	1 Hour	0.18 ppm	-	
Sulfur Dioxide	Annual Mean	-	0.030 ppm	-
	24 Hour	0.04 ppm	0.14 ppm	-
	3 Hour			0.50 ppm
	1 Hour	0.25 ppm		-
Respirable Particulate Matter (PM_{10})	Annual Mean	20 ug/m^3	50 ug/m^3	Same as primary
	24 Hour	50 ug/m^3	150 ug/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	12 ug/m^3	15 ug/m^3	Same as primary
	24 Hour	-	35 ug/m^3	
Sulfates	24 Hour	25 ug/m^3	-	-
Lead	30 Day Average	1.5 ug/m^3	-	-
	Calendar Quarter	-	1.5 ug/m^3	Same as primary
Hydrogen Sulfide	1 Hour	0.03 ppm	N/A	N/A
Vinyl Chloride	24 Hour	0.01 ppm	N/A	N/A

ppm = Parts per Million
ug/m^3 = Micrograms per Cubic Meter

Source: California Air Resources Board, http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm, accessed November 26, 2008.

Particulate Matter

Suspended particulate matter (airborne dust) consists of solid and liquid particles small enough to remain suspended in the air for long periods. "Respirable" particulate matter (PM) consists of particles less than 10 microns in diameter, and is defined as "suspended particulate matter" or PM_{10}. Particles between 2.5 and 10 microns in diameter arise primarily from natural processes, such as wind-blown dust or soil. Fine particles are less than 2.5 microns in diameter ($PM_{2.5}$). $PM_{2.5}$, by definition, is included in PM_{10}. Fine particles are produced mostly from combustion or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces, and wood stoves produce fine particles.

Particulate matter is a complex mixture that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These tiny particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particulate matter is divided into two classes, primary and secondary. Primary particles are released directly into the atmosphere from sources of generation. Secondary particles are formed in the atmosphere as a result of reactions involving gases.

Particles greater than 10 microns in diameter can cause irritation in the nose, throat, and bronchial tubes. Natural mechanisms remove many of these particles, but smaller particles are able to pass through the body's natural defenses, including the mucous membranes of the upper respiratory tract, and enter into the lungs. The particles can damage the alveoli, tiny air sacs responsible for gas exchange in the lungs. The particles may also carry carcinogens and other toxic compounds, which adhere to the particle surfaces and can enter the lungs.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, poisonous gas produced by incomplete burning of carbon-based fuels such as gasoline, oil, and wood. When CO enters the body, the CO combines with chemicals in the body, which prevents blood from carrying oxygen to cells, tissues, and organs. Symptoms of exposure to CO can include problems with vision, reduced alertness, and general reduction in mental and physical functions. Exposure to CO can result in chest pain, headaches, reduced mental alertness, and death at high concentrations.

Nitrogen Oxide Gases

Nitrogen oxide gases (NO_X) are produced from burning fuels, including gasoline and coal. Nitrogen oxide reacts with ROG (found in paints and solvents) to form ozone, which can harm health, damage the environment, and cause poor visibility. Additionally, NO_X emissions are a major component of acid rain. Health effects related to NO_X include lung irritation and lung damage.

Sulfates

Sulfates (SO_X) are colorless gases and constitute a major element of pollution in the atmosphere. SO_X is commonly produced by fossil fuel combustion. In the atmosphere, SO_X is usually oxidized by ozone and hydrogen peroxide to form sulfur dioxide and trioxide (a pollutant). If SO_X is present during condensation, acid rain may occur. Exposure to high concentrations for short periods of time can constrict the bronchi and increase mucous flow, making breathing difficult. Children, the elderly, those with chronic lung disease, and asthmatics are especially susceptible to these effects.

Toxic Air Contaminants

In addition to the criteria pollutants (Table 4.4-1), Toxic Air Contaminants (TACs) are also a category of environmental concern. Many types of TACs exist, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least 40 different TACs. In terms of health risks, the most volatile contaminants are diesel particulate, benzene, formaldehyde, 1,3-butadiene and acetaldehyde.

Public exposure to TACs can result from emissions from normal operations as well as accidental releases. Heath effects of TACs include cancer, birth defects, neurological damage, and death.

Attainment Status and Regional Air Quality Plans

The Federal Clean Air Act and the California Clean Air Act require all areas of California to be classified as attainment, non-attainment, or unclassified as to their status with regard to the national and/or State Ambient Air Quality Standards.

The Federal Clean Air Act of 1990 and the California Clean Air Act of 1988 require that the CARB, based on air quality monitoring data, designate portions of the State where the federal or State ambient air quality standards are not met as "nonattainment areas." Because of the differences between the national and State standards, the designation of nonattainment areas is different under the federal and State legislation.

The Bay Area is currently designated as a nonattainment area for the 1-hour ozone standard. However, in April 2004, U.S. EPA made a final finding that the Bay Area has attained the national 1-hour ozone standard. The finding of attainment does not mean the Bay Area has been reclassified as an attainment area for the 1-hour standard. The region must submit a re-designation request to EPA in order to be reclassified as an attainment area.

The U.S. EPA has classified the San Francisco Bay Area as a nonattainment area for the federal 8-hour ozone standard. The Bay Area is designated as attainment for the annual condition, and unclassifiable for the 24-hour federal $PM_{2.5}$ standards.

Under the California Clean Air Act, Contra Costa County is a nonattainment area for ozone and particulate matter (PM_{10} and $PM_{2.5}$). The County is either attainment or unclassified for all other criteria pollutants. The California Clean Air Act requires local air quality management districts to prepare air quality attainment plans. These plans must provide for district-wide emission reductions of five percent per year averaged over consecutive three-year periods or, provide for adoption of "all feasible measures on an expeditious schedule."

Local Air Quality Monitoring

For many years, the BAAQMD has operated a multi-pollutant monitoring site in nearby Bethel Island. Table 4.4-3 shows historical occurrences of pollutant levels exceeding the State and federal ambient air quality standards for the three-year period 2005-2007. The number of days that each standard was exceeded is shown.

Table 4.4-3 shows that all federal ambient air quality standards are met in the Brentwood area with the exception of the 8-hour ozone standard. Additionally, the State ambient standards of ozone and PM_{10} are occasionally exceeded.

Table 4.4-3
Air Quality Data Summary for Bethel Island (2002-2007)

Pollutant	Standard		Days Exceeding Standard During		
	State	Federal	2005	2006	2007
Ozone (O_3)	1-Hour	—	0	9	0
	—	1-Hour	0	0	0
	—	8-Hour	1	13	1
Carbon Monoxide (CO)	8-Hour	8-Hour	0	0	0
	1-Hour	—	0	0	0
Nitrogen Dioxide (NO_2)	1-Hour	—	0	0	0
Sulfur Dioxide (SO_2)	1-Hour	—	0	0	0
	24-Hour	—	0	0	0
PM_{10}	24-Hour	—	1	1	0
	—	24-Hour	0	0	0

Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2008. (http://www.arb.ca.gov/adam/welcome.html)

Sensitive Receptors

The BAAQMD defines sensitive receptors as facilities where sensitive receptor population groups (children, the elderly, the acutely ill, and the chronically ill) are likely to be located. These land uses include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics.

Sensitive receptors within or near the project area include residential properties and Marsh Creek Elementary School, Liberty High School, Edna Hill Middle School, and a new school yet to be named. In addition, the proposed residential and park uses associated with the project would be considered sensitive receptors.

Global Climate Change

Greenhouse gases (GHG) are those that trap heat in the atmosphere. GHG are emitted by both natural processes and human activities. The accumulation of GHG in the atmosphere regulates the earth's temperature. Without natural GHG, scientists estimate that the Earth's surface would be approximately 61 degrees Fahrenheit cooler.[4] However, scientists also believe that the combustion of fossil fuels (coal, petroleum, natural gas, etc.) for human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. The increase in atmospheric concentrations of GHG has resulted in more heat being held within the atmosphere, which is the accepted explanation for Global Climate Change.

According to the United States Environmental Protection Agency (USEPA), the global warming potential of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." Common GHG components include water vapor, carbon dioxide (CO_2), methane, nitrous oxides, chlorofluorocarbons, hydro-fluorocarbons, perfluorocarbons,

sulfur hexafluoride, ozone, and aerosols. Carbon dioxide is widely used as the reference gas for comparison of equivalent global warming potential. The CO_2 equivalent is a good way to assess emissions because the use of an equivalent gives weight to the global warming potential of the gas. Methane gas, for example, is estimated by the Association of Environmental Professionals and the USEPA to have a comparative global warming potential 21 times greater than that of CO_2, as shown in Table 4.4-4. At the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative global warming potential 23,900 times that of carbon dioxide. The "specified time horizon" is related to the atmospheric lifetimes of such GHGs, which are estimated by the USEPA to vary from 50-200 years for carbon dioxide, to 50,000 years for tetrafluoromethane. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the global warming potential of a gas.

Table 4.4-4
Global Warming Potentials and Atmospheric Lifetimes Of Select Greenhouse Gases

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide	50-200	1
Methane	12 ± 3	21
Nitrous Oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetraflouromethane (CF_4)	50,000	6,500
PFC: Hexaflouroethane (C_2F_6)	10,000	9,200
Sulfur Hexaflouride (SF_6)	3,200	23,900

Source: U.S. Environmental Protection Agency. 2006. Non CO_2 Gases Economic Analysis and Inventory. Global Warming Potentials and Atmospheric Lifetimes.
Website http://www.epa.gov/nonco2/econ-inv/table.html. Accessed December 28, 2007.

One teragram (equal to one million metric tons) of CO_2 equivalent (Tg CO_2 Eq.) is defined by the USEPA as the emissions of the reference GHG multiplied by the equivalent global warming potential. In 2004, total worldwide GHG emissions have been estimated to be 20,135 Tg in CO_2 equivalents. In 2004, the U.S. contributed the greatest percentage of worldwide GHG emissions (35 percent). In 2004, the USEPA estimates that GHG emissions in the U.S. were 7074.4 Tg of CO_2 equivalent, which is an increase of 15.8 percent from 1990 emissions. California is a substantial contributor of GHG as the State is the second largest contributor in the U.S. and the sixteenth largest in the world. In 2004, California is estimated to have produced seven percent of the total U.S. emissions. The major source of GHG in California is transportation, which contributes 41 percent of the State's total GHG emissions, followed by electricity generation, which contributes 22 percent of the State's GHG emissions.

Global Changes

The Intergovernmental Panel on Climate Change (IPCC) *Climate Change 2007*[5] report indicates that the average global temperature is likely to increase between 3.6 and 8.1 degrees Fahrenheit by the year 2100, with larger increases possible but not likely. Temperature increases are expected to vary widely in specific locations depending on a variety of factors. The increase in

temperature is expected to lead to higher temperature extremes, a larger variability in precipitation leading to increased flooding and droughts, ocean acidification from increased carbon content, and rising sea levels.

Changes in the Western United States and California Climate

Climate models indicate that if GHG emissions continue to proceed at a medium or high rate, temperatures in California are expected to increase by 4.7 to 10.5 degrees Fahrenheit by the end of the century.[6] Lower emission rates would reduce the projected warming to three to 5.6 degrees Fahrenheit. Almost all climate scenarios include a continuing trend of warming through the end of the century given the vast amounts of greenhouse gases already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. According to the 2006 Climate Action Team Report[7] the following climate change effects are predicted in California over the course of the next century:

- A diminishing Sierra snowpack declining by 70 percent to 90 percent, threatening the State's water supply;
- Increasing temperatures from eight to 10.4 degrees Fahrenheit, under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas;
- Increased coastal erosion along the length of California and seawater intrusion into the Delta from a four to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions;
- Increased vulnerability of forests to forest fires due to pest infestation and increased temperatures;
- Increased challenges for the State's important agriculture industry from water shortages, increasing temperatures, and saltwater intrusion into the Delta; and
- Increased electricity demand, particularly in the hot summer months.

Therefore, temperature increases would lead to environmental impacts in a wide variety of areas, including: reduced snowpack resulting in changes to the existing water resources, increased risk of wildfires, changing weather expectations for farmers and ranchers, and public health hazards associated with higher peak temperatures, heat waves, and decreased air quality.

Water Resources

Depending on the climate model, precipitation for temperate climates is expected to decrease with an increased potential for drought. Topographical and geographical factors will likely result in substantial variation in the net change in precipitation. However, the form in which precipitation occurs is anticipated to change substantially. Warmer winters would lead to less snow and more rain. As a result, the Sierra snowpack would be reduced and would melt earlier. This change could lead to increased flood risks as more water flows into reservoirs and rivers during the winter rainy period. Furthermore, earlier melting of the snowpack would reduce late spring and summer flows to reservoirs, which combined with hotter, drier summers, could lead to water shortages and restricted water supplies for cities, agriculture, and rivers.

Increased temperatures would also lead to a rise in the sea level, from both thermal expansion and the melting of land-based glaciers. During the past century, sea levels along the California coast have risen by approximately seven inches. Climate forecasts indicate the sea level would rise by seven to 23 inches over the next 100 years depending on the climate model.[8] Substantial melting of either the Greenland or Antarctic ice sheets would lead to an even greater increase; however, the IPCC models do not indicate that this would occur within the next 100 years, which is the boundary of most climate models. Longer forecast periods are inherently less reliable as they require more assumptions, and tend to compound the effects of assumptions that may be incorrect. Increases in sea level could lead to increased coastal flooding, salt water intrusion into aquifers, and disrupt wetlands and estuaries.

Wildfires

Increased temperatures would lead to increases in evapotranspiration. The summers would likely be drier, and vegetation would also be more likely to dry out, resulting in increasingly more flammable forests and wildlands. In addition, warmer temperatures could lead to the expansion of pests that kill and weaken trees, leading to increases in the amount of highly flammable dead trees, increasing the risk of large forest fires.

Weather Extremes

The temperature increases presented in climate change models are yearly averages. Within those averages is the potential for substantially hotter summers and/or colder winters. As a result of Global Climate Change, the weather is expected to become more variable, with larger extremes. In California, the increase in temperatures is expected to lead to more days with temperatures in excess of 95 degrees. More days of extreme heat has implications for public health, as Californians would face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. In addition, increased temperatures have implications for agricultural crops, particularly long-term crops such as grapes and fruit trees that are planted in particular locations to take advantage of micro-climates.

Air Quality

Increased temperatures create the conditions in which ozone formation can increase, which would lead to adverse impacts to air quality. In addition, hotter temperatures would likely result in increased electricity use to power air conditioners and refrigerators. Increased power use has the potential to result in increased air pollutant emissions, as more electrical generation is needed to meet the demand.

<u>Uncertainty Regarding Global Climate Change</u>

The scientific community has largely agreed that the earth is warming, and that humans are contributing to that change. However, the earth's climate is composed of many complex mechanisms, including: ocean currents, cloud cover, as well as the jet-stream and other pressure/temperature weather guiding systems. These systems are in turn influenced by changes in ocean salinity, changes in the evapotranspiration of vegetation, the reflectivity (albedo) of

groundcover, as well as numerous other factors. Some changes have the potential to reduce climate change, while others could form a feedback mechanism that would speed the warming process beyond what is currently projected. The climate system is inherently dynamic; however, the overall trend is towards a gradually warming planet.

Regulatory Context

Air quality is monitored through the efforts of various federal, State, regional, and local government agencies. These agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for regulating and improving the air quality within the Brentwood area are discussed below.

Federal

U.S. Environmental Protection Agency (EPA)

The U.S. EPA is responsible for enforcement of National Ambient Air Quality Standards (NAAQS). The EPA has adopted policies requiring states to prepare State Implementation Plans (SIP) that demonstrate attainment and maintenance of the NAAQS. After a review of the SIP, the EPA will further classify non-attainment areas according to a District's projected date of attainment. Districts that project attainment of standards in three to five years would be classified as near-term non-attainment, whereas Districts that cannot meet standards within five years would be classified as long-term non-attainment. For an area to be classified as near-term non-attainment, the District would be required to demonstrate that pollutant reductions of three-percent-per-year are obtainable and that maintenance of standards could occur for ten years.

In 1997, the EPA adopted new national air quality standards for ground-level ozone and for fine particulate matter ($PM_{2.5}$). These standards determined that the existing 1-hour ozone standard of 0.12 parts-per-million (ppm) would be phased out and replaced by an 8-hour standard of 0.08 ppm. New national standards for fine particulate matter (diameter 2.5 microns or less) were established for 24-hour and annual averaging periods.

The established PM_{10} standards were retained, but the method and form for determining compliance with the standards were revised. Implementation of the new ozone and Particulate Matter standards was delayed by a lawsuit. On May 14, 1999 the Court of Appeals for the District of Columbia Circuit issued a decision ruling that the Clean Air Act as applied in setting the new public health standards for ozone and particulate matter was unconstitutional and an improper delegation of legislative authority to the Environmental Protection Agency. The United States Supreme Court revised the District of Columbia Circuit's decision in 2001, clearing the way for implementation of the new standards. During the interim period, the California Clean Air Resources Board developed recommended designations for California air basins, proposing that Contra Costa County be designated as non-attainment for the new 8-hour ozone standard. Designations for $PM_{2.5}$ have not been made, however, a minimum three-year monitoring period is required.

The USEPA has been directed to develop regulations to address the GHG emissions of cars and trucks. At the time of this writing, USEPA regulations for GHGs do not exist.

State

California Clean Air Act

The California Clean Air Act (CCAA) requires that air quality plans be prepared for areas of the State that have not met State air quality standards for ozone, CO, NO_X, and SO_2. Among other requirements of the CCAA, the plans must include a wide range of implementable control measures, which often include transportation control measures and performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls.

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that the Air Resources Board (ARB) develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the ARB to be vehicles whose primary use is noncommercial personal transportation in the state." Currently, the State is waiting for a determination on the State's request for a waiver from the USEPA to begin regulation of GHG emissions from vehicles.

Executive Order S-3-05

In 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established total GHG emission targets. Specifically, emissions are to be reduced to year 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (Cal-EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary is also directed to submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts.

To comply with the Executive Order, the Secretary of the Cal-EPA created a Climate Act Team (CAT) made up of members from various state agencies and commissions. In March 2006, CAT released their first report. In addition, the CAT has released several "white papers" addressing issues pertaining to the potential impacts of climate change on California.

Assembly Bill 32

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased starting in 2012. To implement

the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Senate Bill 1368

Senate Bill (SB) 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. On January 27, 2007, the PUC adopted an interim Greenhouse Gas Emissions Performance Standard to require that all new long-term commitments for baseload power generation to serve Californians do not exceed the emissions of a combined cycle gas turbine plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC. On May 28, 2007 the Energy Commission adopted regulations pursuant to SB 1368 establishing and implementing a GHG emission performance standard for baseload generation of local publicly owned electric utilities. The final rulemaking package was submitted to the Office of Administrative Law (OAL) on June 1, 2007 with a request for expedited review. On June 29, 2007 OAL issued a decision disapproving the rulemaking action. Revised regulations have not been submitted as of the writing of this DEIR.

Senate Bill 1078

SB 1078 establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 107 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least 1 percent each year. The outcomes of this legislation will impact regional transportation powered by electricity.

Executive Order S-01-07

On January 18, 2007, Governor Schwarzenegger signed Executive Order S-01-07, which mandates that a statewide goal be established to reduce carbon intensity of California's transportation fuels by at least 10 percent by 2020. The Order also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

Senate Bill 375

In September 2008, Governor Arnold Schwarzenegger signed Senate Bill (SB) 375, which is intended to build on AB 32 by attempting to control GHG emissions by curbing sprawl. SB 375 enhances ARB's ability to reach goals set by AB 32 by directing ARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. In addition, ARB will work with the State's 18 metropolitan planning organizations to align their regional transportation, housing, and land-use plans and prepare a "sustainable communities strategy" to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets. SB 375 provides incentives for creating walkable and sustainable communities and revitalizing existing communities, and allows home builders to get relief from certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Furthermore, SB 375 encourages the development of alternative transportation options, which will reduce traffic congestion.

California Air Resources Board (CARB)

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing California's own air quality legislation called the California Clean Air Act (CCAA) adopted in 1988. The CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the U.S. EPA. As discussed above, the CARB is charged with developing rules and regulations to cap and reduce GHG emissions.

The CCAA requires that air quality plans be prepared for areas of the State that have not met State air quality standards for ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide. Areas that met standards by 1994 were classified as moderate, those that attained standards between 1994 and 1997 were classified as serious, and those that could not attain standards until after 1997 were classified as severe. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls.

Bay Area Air Quality Management District

The BAAQMD has permitting authority for stationary air pollutant sources in the region and operates a total of seven air monitoring sites within Contra Costa County. The BAAQMD has prepared guidelines to assist in CEQA review. The BAAQMD maintains annual daily thresholds for ROG, NO_X and PM_{10}. Under these guidelines, any proposed project that would have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

City of Brentwood General Plan

The following are applicable General Plan goals and policies related to air quality from the City of Brentwood General Plan Circulation Element:

Goal 2 Transportation Alternatives. A transportation system that encourages walking, bicycling, and public transit use and encourages shorter commute trips for Brentwood residents.

Policy 2.1 Development Patterns: Recognize the link between land use and transportation. Promote land use and development patterns that encourage walking, bicycling, and transit use. Emphasize well-designed, high-density and mixed land use patterns that promote transit and pedestrian travel.

The following are applicable General Plan goals and policies related to air quality from the City of Brentwood General Plan Conservation and Open Space Element:

Policy 3.3 Air Quality: Preserve and improve air quality in the Brentwood Planning Area.

Goal 5 Create an environment in Brentwood wherein energy resources are efficiently utilized.

Policy 5.1 Bicycle Use: Promote the use of bicycles as an alternative transportation mode.

Policy 5.2 Efficient Development: Encourage the design and construction of energy efficient development.

The following is an applicable General Plan goal related to air quality from the City of Brentwood General Plan Economic Development Element:

Goal 2 Employment. Retain existing employment and balance economic growth across a broad economic spectrum that includes service business, "clean" manufacturing, agricultural and other production-oriented industries.

Impacts and Mitigation Measures

Standards of Significance

According to California Environmental Quality Act (CEQA) Guidelines, an air quality impact may be considered significant if the proposed project's implementation would result in, or potentially result in, conditions, which violate any existing local, State or federal air quality regulations. The BAAQD provides the standards of significance for the Bay Area, which include the following:

- Carbon monoxide (CO) concentrations in excess of the State Ambient Air Quality Standard of 9 parts per million (ppm) averaged over 8 hours or 20 ppm for 1 hour;
- Generation of criteria air pollutant emissions in excess of the BAAQMD annual or daily thresholds. The current thresholds are 15 tons/year or 80 pounds/day for

Reactive Organic Gases (ROG), Nitrogen Oxides (NO_X) or PM_{10}. Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact;

- Exposure of sensitive receptors or the general public to substantial levels of pollutant concentrations; and
- Exposure of substantial numbers of members of the public to objectionable odors.

Despite the establishment of both federal and state standards for $PM_{2.5}$ (particulate matter, 2.5 microns), the BAAQMD has not developed a threshold of significance for this pollutant. For this analysis, $PM_{2.5}$ impacts would be considered significant if project emissions of PM_{10} exceed 80 pounds per day.

The BAAQMD significance threshold for construction dust impacts is based on the appropriateness of construction dust controls. The BAAQMD guidelines provide feasible control measures for construction emissions of PM_{10}. If the appropriate construction controls are implemented, air pollutant emissions for construction activities would be considered less-than-significant.

Method of Analysis

Raney Planning & Management, Inc. (Raney) conducted an air quality assessment for the proposed project utilizing the URBEMIS 2007 Version 9.2.4 program to estimate the total emissions expected for the proposed project. The analysis assumed full buildout of the proposed project, which would include up to 608 dwelling units and 107,267 square feet of retail uses, 87,991 square feet of office uses, and 228,690 square feet of institutional uses.

<u>URBEMIS 2007 Version 9.2.4</u>

Estimates of regional emissions generated by project traffic were made using the URBEMIS 2007 Version 9.2.4 modeling program. The program estimates the emissions that result from various land use development projects. Land use projects can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. URBEMIS 2007 contains default values for much of the information needed to calculate emissions. However, project-specific, user-supplied information can also be used when available.

Inputs to the URBEMIS 2007 program include trip generation rates, vehicle mix, average trip length by trip type, and average speed. Trip generation rates for project land uses were provided by the transportation consultant for the proposed project. Average trip lengths and vehicle mixes for the Bay Area were used. Average speed for all types of trips was assumed to be 30 MPH.

Project-Specific Impacts and Mitigation Measures

4.4-1 Short-term construction-related air quality impacts.

The proposed project includes the construction of commercial, residential, and institutional uses along with associated infrastructure projects to provide roadways, sewer service, and water service to development. Grading, earthmoving and excavation typically generate the majority of PM_{10} emissions. The dry, windy climate of the area during the summer months creates a high potential for dust generation when and if underlying soils are exposed to the atmosphere. Following grading of the site, dust would continue to affect local air quality during construction of the project. Wind blowing over exposed earth would generate fugitive particulate matter emissions that would affect local and regional air quality during construction associated with the project.

Construction activities would also generate exhaust emissions from vehicles/equipment that would affect local air quality. During construction, various diesel-powered vehicles and equipment would be in use. In 1998, CARB identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). A risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines was completed by CARB.[5] High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truckstop) were identified as having the highest associated risk.

Health risks from TACs are functions of both concentration and duration of exposure. However, construction diesel emissions are temporary, affecting an area for a period of days or perhaps weeks. In addition, construction-related sources are mobile and transient in nature, and the bulk of the emission occurs within the project site at a substantial distance from nearby receptors. Because of the short duration of construction activities, health risks from construction emissions of diesel particulate would not be considered substantial.

Construction activities are also a source of organic gas emissions. Solvents in adhesives, non-waterbased paints, thinners, some insulating materials, and caulking materials evaporate into the atmosphere and through a photochemical reaction contribute to the creation of urban ozone. Asphalt used in paving is also a source of organic gases for a period of time following application.

According to the BAAQMD *CEQA Guidelines*, emissions of ozone precursors (ROG and NO_X) and carbon monoxide related to construction equipment are already included in the emission inventory that is the basis for regional air quality plans, and thus are not expected to impede attainment or maintenance of ozone and carbon monoxide standards in the Bay Area. Therefore, the primary air quality effects of construction activities undertaken as a result of implementation of the project would be increased dustfall and locally elevated levels of PM_{10} (including $PM_{2.5}$) downwind of construction activity. Construction dust has the potential for creating a nuisance at nearby properties, resulting in a ***potentially significant*** impact.

Mitigation Measure(s)
As outlined in the BAAQMD *CEQA Guidelines*, implementation of the following mitigation measures would reduce any impacts related to construction dust emissions to a *less-than-significant* level.

4.4-1 *Consistent with guidance from the BAAQMD, prior to issuance of any grading permits, the applicant shall incorporate the following mitigation measures into the construction contract documents, which shall be submitted for the review and approval of the City Engineer:*

- *Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives;*
- *Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard;*
- *Pave, apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;*
- *Sweep daily (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality;*
- *Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets;*
- *Apply non-toxic soil stabilizers to inactive construction areas;*
- *Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);*
- *Limit traffic speeds on unpaved roads to 15 mph;*
- *Install sandbags or other erosion control measures to prevent silt runoff to public roadways; and*
- *Replant vegetation in disturbed areas as quickly as possible.*

The above measures include all feasible measures for construction emissions identified by the Bay Area Air Quality Management District.

4.4-2 Impacts to regional air quality due to project trip generation.

Vehicle trips generated by the project would result in air pollutant emissions affecting the entire San Francisco Bay Air Basin. The project would replace existing land uses with new uses, and result in new development on land that is currently vacant. The project is expected to result in the construction of approximately 608 dwelling units and 107,267 square feet of retail uses, 87,991 square feet of office uses, and 228,690 square feet of institutional uses.

While the mixed-use design of the project would reduce the number of vehicle trips, the project is expected to generate an additional 13,129 net new daily vehicle trips. Regional emissions associated with project vehicle use have been calculated using the URBEMIS 2007 emission model. The incremental daily emission increase associated with project land uses is identified in Table 4.4-5 for reactive organic gases and oxides of nitrogen (two precursors of ozone) and PM_{10}. The Bay Area Air Quality Management District has established thresholds of significance for ozone precursors and PM_{10} of 80 pounds per day. As shown in Table 4.4-5, the proposed project emissions would substantially exceed these thresholds of significance; therefore, the proposed project would have a ***significant*** impact on regional air quality.

Table 4.4-5
Project Regional Emissions in Pounds Per Day (PPD)

Pollutant	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Project Buildout (Unmitigated)	146.44	128.76	225.75
BAAQMD Significance Threshold	**80.0 PPD**	**80.0 PPD**	**80.0 PPD**

Source: URBEMIS 2007, Version 9.2.4, November 2008.

Mitigation Measure(s)

The following mitigation measures would reduce the magnitude of project emissions of criteria pollutants; however, mitigation measures are not available to reduce impacts to below the BAAQMD significance threshold. Therefore, implementation of the proposed project would result in a *significant and unavoidable* impact to regional air quality.

4.4-2(a) *Prior to approval of a tentative map or site plan for an individual sub-area, the tentative map or site plan shall show bicycle lanes and/or paths connected to the community-wide network and sidewalks and/or paths connected to adjacent land uses, transit stops, and/or community-wide network, for approval by the Community Development Director and the City Engineer.*

4.4-2(b) *The BAAQMD has identified mitigation measures for reducing emissions from commercial uses. Prior to approval of a site plan, a transportation management plan shall be created and submitted for the approval of the Community Development Director and the City Engineer. The transportation management plan may include the following measures:*

- *Design and locate buildings to facilitate transit access, such as locating local building entrances near transit stops and eliminating building setbacks;*
- *Provide secure, weather-protected bicycle parking for employees;*
- *Provide safe, direct access for bicyclists to adjacent bicycle routes;*
- *Provide showers and lockers to employees bicycling or walking to work;*

- *Provide secure short-term bicycle parking for retail customers and other non-commute trips;*
- *Provide direct, safe, attractive pedestrian access from project to transit stops and adjacent development;*
- *Implement carpool/vanpool programs such as carpool ridematching for employees, assistance with vanpool formation or provision of vanpool vehicles;*
- *Provide on-site shops and services for employees, such as cafeteria, bank/ATM, dry cleaners, and convenience markets;*
- *Provide on-site child care, or contribute to off-site child care within walking distance;*
- *Implement parking fees for single occupancy vehicle commuters;*
- *Use of exterior and interior paints with low quantities of volatile organic compounds;*
- *Implement parking cash-out program for employees (i.e., non-driving employees receive transportation allowances equivalent to value of subsized parking); and*
- *Implement parking cash-out program for employees (i.e., non-driving employees receive transportation allowance equivalent to value of subsidized parking).*

4.4-2(c) *Prior to the issuance of building permits, the applicant shall include in the project design the following measures to the satisfaction of the Community Development Director and the Chief Building Official:*

- *Allow only natural gas fireplaces or stoves in single-family houses. Wood, pellet, or traditional open hearth fireplaces shall not be permitted;*
- *Use of exterior and interior paints with low quantities of volatile organic compounds;*
- *Residences will include outside electrical outlets to allow electric lawn and garden equipment for landscaping; and*
- *Utilize reflective (or high albedo) and emissive roofs and light colored construction materials where reasonably practical to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.*

4.4-3 Impacts to residences located next to Brentwood Boulevard (State Route [SR] 4).

The California Air Resources Board recently published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005). The document makes the recommendation to "Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day." As stated in Chapter 4.3, Transportation and Circulation, Brentwood Boulevard currently serves approximately 20,000 vehicle trips per day. While the proposed project would

place future residents within 500 feet of the existing Brentwood Boulevard, the daily trip generation is substantially less than the identified thresholds, and the SR 4 Bypass, which is currently being constructed, would further reduce traffic on Brentwood Boulevard; therefore, a ***less-than-significant*** impact would occur.

Mitigation Measure(s)
None required.

Cumulative Impacts

As defined in Section 15355 of the *CEQA Guidelines*, "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

An assessment of cumulative impacts should consider impacts identified as significant, as well as impacts identified as less-than-significant for individual projects that may become significant in a collective sense when considering the co-occurrence of multiple projects.

4.4-4 Cumulative impacts to regional air quality.

According to BAAQMD significance criteria, any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. For any project that does not have significant operational air quality impacts, the determination of significant cumulative impacts should be based on an evaluation of the consistency of the project with the local General Plan and the consistency of the General Plan with the regional air quality plan (i.e., the most recently adopted Clean Air Plan).

If a project requires a General Plan Amendment, a significant cumulative impact could occur if the project generates more Vehicle Miles Traveled than anticipated under the previous land use designation(s), due to inconsistency with the regional air quality plan. The regional air quality plan is based on Association of Bay Area Governments (ABAG) projections, which are, in turn, based on City and/or County General Plans.

The proposed project would involve a change in General Plan land use designations. In general, these redesignations change proposed uses from mixed-use business park and residential to commercial, office, institutional, and residential uses, which may generate additional trips than development under the current designations. As buildout of the proposed project would result in a significant individual impact to air quality, the project would also result in a ***significant*** cumulative impact to air quality.

Mitigation Measure(s)

The following mitigation measures would reduce the magnitude of project emissions of criteria pollutants; however, mitigation measures are not available to reduce impacts to below the BAAQMD significance threshold. Therefore, implementation of the proposed project would result in a *significant and unavoidable* cumulative impact to regional air quality.

4.4-4 Implement Mitigation Measure 4.4-2(a-c).

4.4-5 Project impacts concerning the production of greenhouse gases.

The cumulative increase in GHG concentrations in the atmosphere has contributed to, and will continue to contribute to, increases in global average temperature and associated shifts in climatic and environmental conditions. Multiple adverse environmental effects are attributable to Global Climate Change, such as sea level rise, increased incidence and intensity of severe weather events (e.g., heavy rainfall, droughts), and extirpation or extinction of plant and wildlife species. Given the significant adverse environmental effects linked to Global Climate Change induced by GHGs, the emission of GHGs is considered a significant cumulative impact. Emissions of GHGs contributing to Global Climate Change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a). Therefore, the cumulative global emissions of GHGs contributing to Global Climate Change can be attributed to every nation, region, and city, and virtually every individual on Earth. The challenge in assessing the significance of an individual project's contribution to global GHG emissions and associated Global Climate Change impacts is to determine whether a project's GHG emissions – which are at a micro-scale relative to global emissions – result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact.

Qualitative vs. Quantitative Assessment

As discussed above, CARB and other air quality regulatory agencies have not issued any guidance that agencies can follow in evaluating how land use developments contribute to climate change. While there are some established methodologies and mitigation measures for stationary source emissions, an accepted methodology for evaluating how land use projects may contribute to climate change via mobile source emissions does not exist.

Issues of GHG emissions and climate change are fundamentally different from other areas of air quality impact analysis, which are all linked to some region or area in which the impact is significant. In the case of toxic air contaminants, that area typically is a localized area. In the case of ozone precursors, that area is typically the air basin. In those contexts, where air quality is linked to a particular location or area, considering the creation of new emissions in that area to be an environmental impact is sensible.

As demonstrated below, calculating the approximate GHG emissions from automotive vehicles that would result from buildout of the project is possible; however, it should be noted that the emissions calculations have significant limitations. These calculations allow the user to estimate GHG emissions in pounds per day or tons of CO_2 per year for various land uses and projects. The calculations also included some features that minimized double counting of trips, because the traffic study included trip reductions. However, the GHG emissions calculations presented here only evaluate and model aggregate CO_2 emissions, they do not demonstrate, with respect to a global impact, how much of these aggregate emissions are in fact "new" emissions specifically attributable to the project.

This fact is critically important, because the approval of the proposed project would not directly result in the creation of new drivers – the primary source of the proposed project's emissions. New residents, employees, and patrons of the project would most likely be switching their greenhouse gas emissions from one place to another, rather than creating new emissions. Thus, the use of models that measure overall emissions, without accounting for existing emissions, would substantially overstate the proposed project's impact on GHG emissions. Overstating the impacts of the proposed project on GHG emissions could lead to misallocation of resources in seeking solutions to GHG emissions and climate change problems. Instead, a more effective approach to resolving climate change issues would include imposing State or federal regulations on fuel formulation, vehicles, and the like; as California is attempting to do with the Low Carbon Fuel Standard.

Sciortino Ranch

The major sources of GHG emissions generated from the proposed project are vehicle source CO_2 emissions. Vehicle transportation is one of the major contributors to GHG emissions in Contra Costa County and the City of Brentwood. Vehicle emissions primarily consist of CO_2 from the tailpipe during vehicle operation. Using the URBEMIS outputs contained in the Air Quality Assessment (Appendix E of this Draft EIR), approximately 46,009.24 tons (US) of CO_2 per year would be generated by the vehicle trips associated with the proposed project. In comparison, carbon dioxide emissions in California totaled approximately 391 million tons in 2004.[9] It should be noted that while the CO_2 emissions factor does assume certain reductions in vehicle emissions due to future vehicle models operating more efficiently, the factor does not take into account additional reductions in vehicle emissions that might take place in response to AB 1493, if mobile source emission reductions are ultimately implemented through legislation. In addition, GHG emissions would result from the energy used to create materials used for development of the proposed project. However, the actual GHG emissions totals generated by buildout of the proposed project are likely much lower than the figure listed above, as the vast majority of the vehicle trips "generated" by the project are already occurring elsewhere.

Project Compliance with GHG Reduction Strategies

The Cal-EPA Climate Action Team developed a report that proposes a path to achieve the Governor's targets that will build on voluntary actions of California businesses, local government and community actions, and State incentive and regulatory programs. The report indicates that the strategies would reduce California's emissions to the levels proposed in Executive Order S-3-05. The strategies that apply to the project are contained in Table 4.4-6. As shown in the table, the project would comply with the potential measures set forth by the Climate Action Team to bring California to the emission reduction targets.

Table 4.4-6
Project Compliance with GHG Emissions Reduction Strategies

Agency	Strategy	Project Compliance with Reduction Strategy
California Air Resources Board (CARB)	Vehicle Climate Change Standards Heavy-Duty Vehicle Emissions Reduction Measures	**Compliant.** The vehicles that access the project will be in compliance with any vehicle standards that are established by CARB.
	Diesel Anti-Idling	**Compliant.** CARB's Airborne Toxic Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling ensures that diesel trucks accessing the project site would not idle.
California Energy Commission	Building Energy Efficiency Standards Appliance Energy Efficiency Standards	**Compliant.** California law requires compliance with Title 24 efficiency standards.
State Department of Business, Transportation, and Housing	Measures to Improve Transportation Energy Efficiency	**Compliant.** The project would facilitate the development of areas adjacent to existing urbanized areas. In addition, the project includes pedestrian and bicycle paths and amenities. All of these features promote transportation efficiency.

The increase in energy efficiency and programs designed to promote fuel conservation through the reduction in vehicle trips would reduce the project's incremental contribution to GHG emissions and Global Climate Change in a manner that is consistent with the strategies to reduce California's emissions to the level proposed in Executive Order S-3-05. Furthermore, the project would implement a substantial portion of the California Attorney General's Office Recommendation Strategies[10] by including pedestrian, bicycle, and public transportation facilities. In addition, the project would include trip reduction measures, require increased building efficiency, and would develop an existing vacant infill site with a mixed-use project. Therefore, the project would include both community design and individual project-specific measures to reduce GHGs.

Conclusion Regarding Global Climate Change

Given the overwhelming scope of Global Climate Change, a single development project would be unlikely to have an individually discernable effect on climate change, i.e., that any increase in global temperature or sea level could be attributed to the emissions resulting from the proposed project. A more appropriate discussion would center on how the proposed project could combine with emissions across California, the United States, and the globe to cumulatively contribute to climate change.

The Sciortino Ranch project is proposed to be a mixed-use infill project, which would, by its very nature, reduce the vehicle miles traveled (vmt) associated with the project and would, in turn, reduce the GHG emissions created by new vehicle trips associated with the project. In addition, as noted in the *Draft Sciortino Ranch Design Guidelines*, the project would situate mixed-use development in close proximity to existing public transit facilities, and would provide safe and convenient pedestrian and bicycle access to transit stops. Furthermore, the project would provide on-site retail shops and services for employees of potential office uses within the project site. Implementation of these design measures would further reduce the GHG emissions that would be created by the project.

However, even in a cumulative discussion of climate change, declaring an impact significant, or not significant, implies knowledge of the incremental effects of the proposed project to the global cumulative scenario. To determine whether the proposed project would have a significant impact associated with climate, in light of the fact that significance thresholds for such an impact do not exist, would be speculative and substantial evidence is not available at present to legitimately evaluate the issue in this EIR. Therefore, consistent with CEQA Guidelines Section 15145, because the City has made an effort to fully explore the potential for climate change and has determined that the conclusion would be speculative, a determination of significance cannot be made. All of the mitigation measures included in this Air Quality chapter would reduce GHG emissions to some extent.

The California Air Pollution Control Officers Association (CAPCOA) recently released a white paper entitled *CEQA and Climate Change*.[11] The white paper includes a section that identifies mitigation strategies for GHG emissions. These potential mitigation measures could be applied to projects during the CEQA process to reduce a project's contribution to GHG emissions. The following recommendations were taken from this section of the white paper and are included in this EIR as recommendations for further reducing the magnitude of the proposed project's GHG emissions.

(a) *The project should provide parking lot areas with 50 percent tree cover within 10 years of construction. Trees included should be native, low-emitting, low maintenance, drought-resistant trees.*

(b) *Locally-made building materials should be used for construction of the project and project infrastructure. In addition, demolished construction material should be recycled.*

(c) Development of the project should be consistent with requirements for neighborhood electric vehicles.

(d) The project should include the following energy efficient building components:

- *Installation of Energy Star-labeled roof materials;*
- *Orientation of at least 75 percent of homes and other buildings to face either north or south (within 30 degrees of north or south);*
- *Optimization of thermal distribution of buildings by separating ventilation and thermal conditioning systems;*
- *Installation of electric vehicle charging facilities;*
- *Installation of energy-reducing programmable thermostats that automatically adjust temperature settings; and*
- *Installation of low water use appliances.*

Endnotes

[1] City of Brentwood. *General Plan Update*. Amended through January 2006.
[2] City of Brentwood. *City of Brentwood General Plan Update EIR*. June 2001.
[3] Bay Area Air Quality Management District. *BAAQMD CEQA Guidelines*. December 1999.
[4] Association of Environmental Professionals. *Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents*. June 29, 2007.
[5] Meehl, G.A., T.F. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda, S.C.B. Raper, I.G. Watterson, A.J. Weaver and Z.-C. Zhao, 2007: Global Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
[6] California Climate Change Center. *Our Changing Climate: Assessing the Risks to California*. 2006.
[7] California Climate Action Team. *Climate Action Team Report*. March 2006.
[8] California Climate Action Team. *Climate Change 2007*. March 2006.
[9] California Energy Commission. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004* (Publication CEC-600-2006-013-D). 2006.
[10] Office of the California Attorney General. *Global Warming Measures*. http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf. Updated September 26, 2008.
[11] California Air Pollution Control Officers Association. *CEQA and Climate Change*. January 2008.

4.5 NOISE

4.5 NOISE

Introduction

The Noise chapter discusses the existing noise environment in the immediate vicinity of the Sciortino Ranch project and identifies potential noise-related impacts and mitigation measures associated with the proposed project. Specifically, this chapter analyzes potential noise impacts due to and upon development within the project site relative to applicable noise criteria and to the existing ambient noise environment. This chapter is primarily based on the *Environmental Noise Assessment* prepared specifically for this project by j.c. brennan & associates, Inc.,[1] as well as the *City of Brentwood General Plan Update EIR*.[2]

Existing Environmental Setting

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.

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. A strong correlation exists between A-weighted sound levels (expressed as dBA, see Table 4.5-1, Acoustical Terminology) 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 chapter are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

Table 4.5-1 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.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours (10 p.m. - 7 a.m.) weighted by a factor of 10 prior to averaging.
Decibel or dB	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.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but without evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50 percent 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 of 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 for 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 percent of incident sound has an absorption of one 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 singe pitches.
Source: j.c. brennan & associates, Inc., 2008.	

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.

Table 4.5-2 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; and
- 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. Completely satisfactory methods for measuring the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction do not exist. 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 is to compare the new noise environment 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 the noise.

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

- Except in carefully controlled laboratory experiments, a change of one dBA cannot be perceived;
- Outside of the laboratory, a three dBA change is considered a just-perceivable difference;
- A change in level of at least five 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 4.5-2 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: Technical Noise Supplement, Traffic Noise Analysis Protocol, Caltrans, October 1998.		

Fundamentals of Groundborne Vibration

Vibration, like noise, involves a source, a transmission path, and a receiver. While vibration is related to noise, vibration 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 that 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 (in/sec). 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 4.5-3 indicates that the threshold for damage to structures ranges from two to six in/sec. One-half this minimum threshold or one 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 4.5-3. 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 0.05 in/sec PPV, is considered a reasonable criterion that would protect against human annoyance in most cases.

Table 4.5-3
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.

Sensitive Noise Receptors

Some land uses are more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure time and shielding from noise sources) and the type of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, parks, and outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses.

Major Noise Sources in the Project Vicinity

Transportation

Vehicle traffic on Brentwood Boulevard (SR 4) is a primary noise source within the project site. Because SR 4 is a primary east/west state highway that connects the East Bay area with the

major cities to the east, SR 4 is also a primary truck route. Currently, the SR 4 Bypass is under the final stages of construction. The Bypass is expected to divert truck traffic and a portion of automobile traffic from Brentwood Boulevard.

Non-Transportation

Commercial land uses located along Brentwood Boulevard and west of the project site, inherently have noise producing components associated with their operations. The components generally include truck deliveries, on-site truck circulation, trash pickup, parking lot use, heating, ventilation, and air conditioning (HVAC) equipment and loading docks.

Noise-Sensitive Land Uses in the Project Vicinity

Noise sensitive land uses in the immediate project vicinity consist of single-family residential to the north and to the south of the site, commercial uses located west of the site and across Brentwood Boulevard, and residential uses under construction to the east.

Existing Noise Environment in the Project Vicinity

Existing Traffic Noise Levels

Table 4.5-4 shows the predicted existing traffic noise levels in terms of the Day/Night Average Level descriptor (L_{dn}) 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.

Existing Ambient Noise Levels

The results of continuous noise level measurements are shown in Table 4.5-5. Continuous noise monitoring results are presented graphically in Appendix C of the Noise Assessment included as Appendix F of this DEIR.

Regulatory Context

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

Table 4.5-4
Existing No Project Traffic Noise Levels

Roadway	Segment	Distance[1] (feet)	Traffic Noise Level, L_{dn} (dBA)	Distance to Contours (feet)		
				70 L_{dn}	65 L_{dn}	60 L_{dn}
Brentwood Blvd.	North of Lone Tree	100	63.6	37	81	174
Brentwood Blvd.	Lone Tree to Sunrise	100	64.5	43	93	200
Brentwood Blvd.	Sunrise to Gregory	100	64.5	43	92	198
Brentwood Blvd.	Gregory to Homecoming	100	64.4	42	92	197
Brentwood Blvd.	Homecoming to Grant / Sunset	100	64.5	43	93	199
Brentwood Blvd.	Grant / Sunset to Sunset Court	100	64.7	44	96	206
Brentwood Blvd.	Sunset Court to Havenwood	100	64.8	45	97	209
Brentwood Blvd.	Havenwood to Applewood	100	64.8	45	97	209
Brentwood Blvd.	Applewood to Sand Creek	100	65.0	46	100	215
Brentwood Blvd.	Sand Creek to Technology	100	64.8	45	98	210
Brentwood Blvd.	Technology to Village	100	64.9	46	99	214
Brentwood Blvd.	Village to Central / Sycamore	100	64.7	44	96	206
Brentwood Blvd.	South of Central / Sycamore	100	63.7	38	82	177
Sand Creek Road	Brentwood to O'Hara	100	62.3	31	66	143
Sand Creek Road	West of O'Hara	100	64.1	40	87	187
O'Hara Ave.	Sand Creek to Saddle Creek	100	62.9	34	73	156
Lone Tree	East of Brentwood	100	52.3	7	14	31
Lone Tree	West of Brentwood	100	61.6	27	59	127
Grant Street	West of Brentwood	100	56.7	13	28	60
Sunset Road	East of Brentwood	100	60.4	23	49	106
Havenwood Ave.	East of Brentwood	100	51.7	6	13	28
Havenwood Ave.	West of Brentwood	100	46.1	3	5	12
Sand Creek Road	East of Brentwood	100	48.4	4	8	17
Central Blvd.	West of Brentwood	100	59.1	19	40	87
Sycamore Ave.	East of Brentwood	100	59.0	20	42	91

[1] Distances are reference distances from centerline of roadway.

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

State Regulations

The California Environmental Quality Act (CEQA) Guidelines in Appendix G, indicates that a significant noise impact may occur if a project exposes persons to noise levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels.

Table 4.5-5
Sciortino Ranch Existing Ambient Noise Monitoring Results

Site	Date	Measured L_{dn}	Average Hourly Daytime (7:00am - 10:00pm)			Average Hourly Nighttime (10:00pm – 7:00am)		
			L_{eq}	L50	L_{max}	L_{eq}	L50	L_{max}
Continuous Noise Level Measurement Sites								
A	October 28-29, 2008	52.6 dB	50.3 dB	43.5 dB	61.7 dB	44.9 dB	43.3 dB	56.4 dB
	October 29-30, 2008	53.8 dB	53.0 dB	47.8 dB	62.8 dB	44.8 dB	42.3 dB	56.7 dB
B	August 1-2, 2007	69.2 dB	66.7 dB	63.4 dB	82.2 dB	61.6 dB	54.3 dB	77.1 dB
Short-Term Noise Level Measurement Sites								
1	October 30, 2008	N/A	51.8 dB	51.1 dB	62.1 dB	@ 10:04 a.m.		
		N/A	50.5 dB	49.7 dB	59.3 dB	@ 1:29 p.m.		
2	October 30, 2008	N/A	58.4 dB	56.3 dB	73.9 dB	@ 10:31 a.m.		
		N/A	58.1 dB	56.9 dB	63.4 dB	@ 1:52 p.m.		
3	October 30, 2008	N/A	53.9 dB	51.6 dB	67.3 dB	@ 11:00 a.m.		
		N/A	54.9 dB	54.0 dB	61.4 dB	@ 2:16 p.m.		

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

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including single- and multi-family residences. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. Title 24 also mandates that for structures containing noise-sensitive uses to be located where the L_{dn} or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

Local Regulations

<u>City of Brentwood General Plan Noise Element:</u>

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. The following goals and policies from the Noise Element are applicable to the proposed project.

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.

1.1.1. New Development: Require mitigation in new developments so that transportation noise exposure on site does not exceed the levels shown in Table 4.5-6.

Table 4.5-6
(Table EC-1 in the General Plan)
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 L_{dn} or CNEL noise scale
[3] L_{eq}, 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 L_{dn}/CNEL, or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/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.

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

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.

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 L_{dn} or CNEL, hourly L_{eq}, 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.

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, shown in Table 4.5-7, at the property line of lands designated for noise-sensitive uses:

Table 4.5-7
(Table EC-2 in the General Plan)
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 (L_{eq}, dBA)	50	45
Maximum Level (dBA)	70	65

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

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.

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.

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).

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.

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

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 sound walls 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.

City of Brentwood Noise Ordinance

The City of Brentwood Noise Ordinance, Chapter 9.32, establishes an exterior noise level of 60 dB between 7:00 a.m. and 10 p.m. in residential areas. From 10:00 p.m. to 7:00 a.m., the maximum allowable noise level is 45 dB.

As shown in Table 4.5-8, the Noise Ordinance also includes restrictions on construction-related noise levels (including grading and trenching) within residential areas in the City.

Table 4.5-8 City Noise Ordinance Construction Hours	
Days	**Times construction is allowed**
Monday through Friday	7:00 a.m. – 7:00 p.m.
Saturday	9:00 a.m. – 4 p.m.
Sunday and City holidays	Construction not allowed
Source: j.c. brennan & associates, Inc., 2008.	

Impacts and Mitigation Measures

Standards of Significance

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

The City of Brentwood General Plan Noise Element does not contain specific policies pertaining to vibration levels. However, vibration levels associated with construction activities 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. Caltrans indicates that the threshold for damage to structures ranges from two to six in/sec. One-half this minimum threshold or one in/sec peak particle velocity (PPV) is considered a safe criterion that would protect against architectural or structural damage.

For the purposes of this analysis implementation of the project would result in significant noise impacts if the project would result in any of the following:

- Exposure of persons to, or generation of, exterior and interior noise levels of 60 dB L_{dn} and 45 dB L_{dn}, respectively, for residential uses exposed to transportation noise sources and the Table 4.5-8 standards for residential uses exposed to stationary noise sources;

- Exposure of persons to, or generation of, ground borne vibration or ground borne noise levels exceeding a threshold of one in/sec PPV;

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as greater than 3 dB; and

- 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 3 dB.

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 3 dB or greater, consistent with the data presented in Table 4.5-9.

Table 4.5-9
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.

Method of Analysis

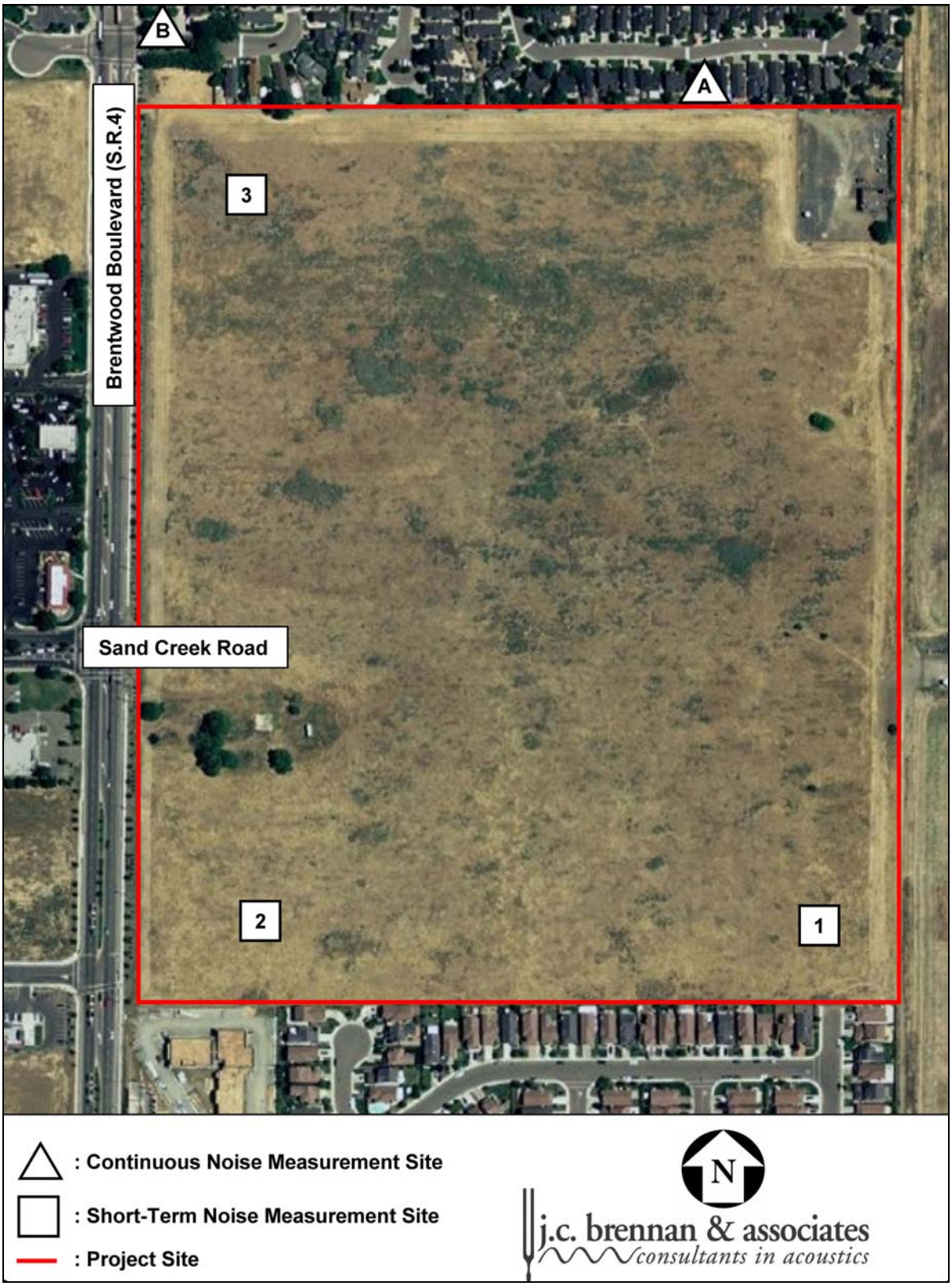
To assess noise impacts due to project-related traffic increases on the existing local roadway network, traffic noise levels are predicted at a representative distance for baseline (identical to the Existing Plus Approved Projects evaluated in the traffic analysis contained in Chapter 4.3 of this DEIR), baseline plus project (identical to the Existing Plus Approved Projects Plus Proposed Project evaluated in the traffic analysis contained in Chapter 4.3 of this DEIR), cumulative, and cumulative plus project.

In order to assess the potential for noise impacts at future noise sensitive development along Brentwood Boulevard, j.c. brennan & associates, Inc. calculated exterior noise levels at a representative distance of 100 feet from the roadway centerline.

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 and October 28-30, 2008. In addition, short-term noise level measurements were conducted at three locations on the project site. The intent of the 24-hour continuous noise level measurements was to determine the existing ambient noise levels on the project site, and to determine the effective day/night distribution of traffic along Brentwood Boulevard. Figure 4.5-1 shows the location of the project site, surrounding land uses, and the noise measurement locations.

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).

Figure 4.5-1
Noise Measurement Locations



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. Table 4.5-10 shows the predicted traffic noise level increases on the local roadway network for the baseline and baseline plus project conditions.

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.

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

Site A

This continuous noise measurement site was located at a single-family residential receiver at 400 Grove Wood Loop, and is adjacent to the north property line of the project site. The noise measurements were conducted for a period of 48-hours. This noise measurement site represents noise sensitive receivers adjacent to the north property line of the project site.

Site B

This continuous noise measurement site was conducted for a period of 24-hours, during the Brentwood Boulevard Specific Plan study in 2007. The noise measurement site is located at the southeast corner of Sunset Court and Brentwood Boulevard, which is one block north of the project site. This was the property of the Perez Nursery. The noise measurements were conducted at a distance of 50 feet from the Brentwood Boulevard centerline.

Site 1

This short-term noise measurement site was located on the southeast portion of the project site and adjacent to existing single-family residential uses. This noise measurement site represents proposed residential receivers within the southeast portion of the project site.

Site 2

This short-term noise measurement site was located on the southwest portion of the project site and adjacent to existing single-family residential uses. This noise measurement site represents proposed residential receivers within the southwest portion of the project site.

Table 4.5-10
Predicted Baseline and Baseline Plus Project Traffic Noise Levels

			Traffic Noise Levels (L_{dn} dBA)			Distance to contours (feet) Baseline			Distance to Contours (feet) Baseline + Project		
Roadway	**Segment**	**Distance[1] (feet)**	**Baseline**	**Baseline + Project**	**Change**	**70 L_{dn}**	**65 L_{dn}**	**60 L_{dn}**	**70 L_{dn}**	**65 L_{dn}**	**60 L_{dn}**
Brentwood Blvd.	North of Lone Tree	100	64.2	65.0	0.8	41	89	192	46	100	216
Brentwood Blvd.	Lone Tree to Sunrise	100	65.5	66.6	1.1	50	108	233	59	128	276
Brentwood Blvd.	Sunrise to Gregory	100	65.5	66.6	1.1	50	108	233	60	128	277
Brentwood Blvd.	Gregory to Homecoming	100	65.5	66.6	1.1	50	108	232	59	128	276
Brentwood Blvd.	Homecoming to Grant / Sunset	100	65.5	66.6	1.1	50	109	234	60	129	277
Brentwood Blvd.	Grant / Sunset to Sunset Court	100	66.0	67.0	1.0	54	117	252	63	136	293
Brentwood Blvd.	Sunset Court to Havenwood	100	66.1	67.1	1.0	55	118	254	64	137	296
Brentwood Blvd.	Havenwood to Applewood	100	66.1	67.1	1.0	55	118	255	64	138	297
Brentwood Blvd.	Applewood to Sand Creek	100	66.2	67.2	1.0	56	121	261	65	140	302
Brentwood Blvd.	Sand Creek to Technology	100	65.7	66.7	1.0	52	112	240	60	129	278
Brentwood Blvd.	Technology to Village	100	65.8	66.7	0.9	52	112	242	60	130	280
Brentwood Blvd.	Village to Central / Sycamore	100	65.6	66.5	0.9	51	109	235	59	127	273
Brentwood Blvd.	South of Central / Sycamore	100	64.6	65.6	1.0	44	94	203	51	110	238
Sand Creek Road	Brentwood to O'Hara	100	63.3	64.5	1.2	36	77	167	43	92	199
Sand Creek Road	West of O'Hara	100	64.8	65.6	0.8	45	97	209	51	110	238
O'Hara Ave.	Sand Creek to Saddle Creek	100	62.9	62.9	0.0	34	73	156	34	73	156
Lone Tree	East of Brentwood	100	52.3	52.3	0.0	7	14	31	7	14	31
Lone Tree	West of Brentwood	100	62.5	63.6	1.1	32	68	147	38	81	175
Grant Street	West of Brentwood	100	59.8	59.8	0.0	21	45	96	21	45	96
Sunset Road	East of Brentwood	100	62.8	62.8	0.0	33	72	155	33	72	155
Havenwood Ave.	East of Brentwood	100	51.7	51.7	0.0	6	13	28	6	13	28
Havenwood Ave.	West of Brentwood	100	50.9	50.9	0.0	5	11	25	5	11	25
Sand Creek Road	East of Brentwood	100	48.4	64.5	**16.1**	4	8	17	43	93	200
Central Blvd.	West of Brentwood	100	59.8	60.3	0.5	21	45	97	23	49	105
Sycamore Ave.	East of Brentwood	100	59.0	59.0	0.0	20	42	91	20	42	91

Bold indicates an increase in noise levels exceeding 3 dB.
[1] Distances are reference from centerline of roadway.

Source: *j.c. brennan & associates, Inc.*, 2008.

Site 3

This short-term noise measurement site was located on the northwest portion of the project site and adjacent to existing single-family residential uses. This noise measurement site represents proposed residential receivers within the northwest portion of the project site.

In order to assess the Cumulative Plus Project traffic noise levels at proposed residential land uses associated with the project, j.c. brennan & associates, Inc. used the FHWA traffic noise prediction model. A distance of 50 feet from the potential property lines to the roadway centerline plus 20 feet to the possible outdoor recreations area was used to determine exterior traffic noise impacts.

Project-Specific Impacts and Mitigation Measures

4.5-1 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 would be exposed to elevated traffic noise levels under baseline conditions either with or without the project. Table 4.5-10 indicates that traffic noise level increases resulting from the proposed project would range from +0.1 dB to +16.1 dB L_{dn}, for baseline conditions relative to no-project conditions. The only roadway segment which would experience noise level increases in excess of three dB is along the Sand Creek Road Extension. However, existing noise-sensitive receivers do not exist along the proposed roadway. Therefore, a ***less-than-significant*** impact would result.

Mitigation Measure(s)
None required.

4.5-2 Impact of traffic noise at future noise-sensitive land uses developed on project site.

The City of Brentwood General Plan Noise Element establishes 60 dB CNEL/ L_{dn} 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. 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.

Outdoor activity areas or patios can be shielded from traffic noise by locating them on the opposite sides of the building façades. Although the amount of shielding that can be expected varies based upon the site design and openings to the roadway. Another means of mitigating noise is to provide sound walls.

Overview of Noise Mitigation Options

The following overview is provided because the site plan is in the conceptual stage, and may be of use during finalization of the project site plans.

Any noise problem may be considered as being composed of three basic elements: the noise source, a transmission path, and a receiver. The appropriate acoustical treatment for a given project should consider the nature of the noise source and the sensitivity of the receiver. The problem should be defined in terms of appropriate criteria (L_{dn}, L_{eq}, or L_{max}), the location of the sensitive receiver (inside or outside), and when the problem occurs (daytime or nighttime). 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 four pounds per 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.

Practical limits exist to the noise reduction provided by barriers. For vehicle traffic or railroad noise, a five to ten 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 three 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 three dB. The open end of "U"-shaped buildings should point away from noise sources for the same reason. Landscaping walls or noise barriers located within a development may inadvertently reflect noise back to a noise-sensitive area unless carefully located. Avoidance of these problems while attaining an aesthetic site design requires close coordination between local agencies, the project engineer and architect, and the noise consultant.

In addition, the project will be required to comply with the *Draft Sciortino Ranch Design Guidelines*. The *Draft Sciortino Ranch Design Guidelines* include the integration of appropriate sound walls and setbacks. The conceptual diagrams propose a limit on the amount of residential uses along Brentwood Boulevard requiring a sound wall.

Noise Reduction by Building Façades

When interior noise levels are of concern in a noisy environment, noise reduction may be obtained through acoustical design of building façades. Standard construction practices provide 10-15 dB noise reduction for building façades 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 façade to remain closed under any weather condition.

Where greater noise reduction is required, acoustical treatment of the building façade 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 a Noise Reduction Coefficient (NRC) 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 visual paths do not extend through the foliage) is required to achieve a five 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.

Traffic Noise Levels

Table 4.5-11 presents the project traffic noise levels on Brentwood Boulevard from Applewood Common to Sand Creek Road and on Sand Creek Road east of Brentwood Boulevard. The two roadway segments are predicted to have traffic noise greater than the 60 dB L_{dn} exterior noise level standard at the proposed residential uses.

The project is anticipated to have traffic noise greater than 60 dB L_{dn} exterior noise level standard at proposed project residential uses. Therefore, the development of the proposed project would have a ***potentially significant*** impact on future sensitive receptors in the project area.

Table 4.5-11
Traffic Noise Levels at Proposed Residential Uses

Roadway	Segment	Possible Receiver Type[1]	Approximate Distance to Outdoor Activity Area[2]	Predicted Traffic Noise Levels, L_{dn} without Mitigation
Brentwood Boulevard	Applewood to Sand Creek Road	LDR/MDR/HDR	70 feet	**69.8 dB**
Sand Creek Road	East of Brentwood Boulevard	MDR/HDR	70 feet	**67.2 dB**

[1] LDR-Low Density Residential. MDR-Medium Density Residential. HDR-High Density Residential.
[2] A 70-foot distance to the outdoor activity area was applied to the FHWA.
Bold indicates predicted traffic noise levels greater than the 60 dB L_{dn} criteria.

Source: FHWA-RD-77-108 with inputs from Kimley Horn Associates and j.c. brennan & associates, Inc.

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

4.5-2 *Prior to approval of tentative maps or site plans, the tentative maps or site plans shall show that all outdoor activity areas of residential and commercial uses are shielded from traffic noise, for the review and approval of the Community Development Director and the City Engineer. The shielding shall be achieved through the site design measures (i.e., setbacks, barriers, site design, building façades, and vegetation). Preliminary barrier calculations indicate that barrier heights of approximately 10 feet would be required along Brentwood Boulevard and seven feet along Sand Creek Road. Future detailed analysis may be required by the Community Development Director per future site plan submittals.*

4.5-3 Impacts related to excessive interior noise levels at future noise-sensitive receptors within the project site.

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. Standard construction practices provide 10-15 dB noise reduction for building façades with open windows, and approximately 25 dB noise reduction when windows are closed. An approximate 25 dB reduction to the noise levels in Table 4.5-11 would reduce the levels to near the acceptable interior noise level standard. Therefore, because the proposed project could expose new dwelling units to interior traffic noise levels in excess of the City's interior noise level standards, the impact is considered ***potentially significant.***

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

4.5-3(a) *Prior to the issuance of building permits for residential uses constructed at the minimum setback along Brentwood Boulevard, the project design shall include glass windows and doors with the sound transmission class (STC) ratings sufficient to mitigate for the predicted traffic noise levels in Table 4.5-11 under the cumulative plus project scenarios. Final design shall be reviewed and approved by the Chief Building Official and/or City Engineer.*

4.5-3(b) *Prior to the issuance of building permits for commercial, office, and institutional uses, mechanical ventilation systems shall be included in the project design for the review and approval of the Chief Building Official. The use of mechanical ventilation systems would allow occupants to keep windows and doors closed to achieve acoustical isolation from traffic noise.*

4.5-3(c) *Prior to the issuance of building permits for first row residential uses constructed along the Brentwood Boulevard corridor, the project design shall ensure that all attic vents be acoustically baffled in first row residential uses constructed along the Brentwood Boulevard corridor. The baffles shall 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. Final design shall be reviewed and approved by the Chief Building Official.*

4.5-4 Impacts of commercial noise sources on existing and future noise-sensitive uses in the project area.

Noise impacts associated with future uses developed within the commercial retail areas cannot practically be evaluated due to the wide range of variables that will affect such noise generation.

Commercial retail land use activities can produce noise that 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.

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.

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, 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.

The zoning of the mixed use areas would allow for uses which could generate significant noise levels that have the potential for off-site adverse noise impacts, even though the impacts cannot practically be quantified at this time. Therefore, the potential commercial noise sources to have impacts on existing and future sensitive land uses associated with the development of the project that would be ***potentially significant***.

<u>Mitigation Measure(s)</u>
Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.5-4(a) *During project review, the Community Development Director shall make a determination as to whether or not the proposed commercial use would likely generate noise levels that could adversely affect the adjacent residential areas. If the determination is made 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 General Plan 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.*

4.5-4(b) *Where commercial uses adjoin residential uses, and loading docks or large truck circulation routes adjoin residential areas, prior to design review approval, the following measures shall be included in the project design, for review and approval of the Community Development Director. The following measures may be modified pending more detailed analysis of future development proposals by an acoustical consultant:*

- *Loading docks should maintain a minimum distance of 100 feet from residential property lines;*
- *Property line barriers should be a minimum of eight 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, including truck idling and use of refrigeration units, 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 possible;*
- *All roof-top exterior heating, cooling and ventilation equipment shall be shielded from view with solid noise barriers, or parapets; and*
- *Emergency generators shall comply with the local noise criteria.*

4.5-4(c) *Prior to approval of site plans within individual sub-areas, the project design shall show, for review and approval of the Community Development Director, where commercial land uses are separated from residential areas by local streets, all loading activities should be located on opposite sides of the buildings from residential uses. This mitigation measure may be modified pending more detailed analysis of future development proposals by an acoustical consultant.*

4.5-5 Impacts of neighborhood parks on future noise-sensitive uses within the project area.

Neighborhood parks 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.

The project area may include several small park sites, and Sub-Area 5A is located adjacent to existing residences. Children playing at neighborhood parks are often considered potentially significant noise sources that 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 L_{eq}, with maximum noise levels ranging from 70 to 75 dB. Playground areas would be expected to be utilized during daytime hours. Therefore, noise levels from the playgrounds would need to comply with the Brentwood 50 dB L_{eq} and 70 dB L_{max} exterior noise level standards at the nearest residential uses. Based upon the reference noise level data discussed above, the 50 dB L_{eq} noise contour would be located approximately 100 feet from the center of park sites. The 75 dB L_{max} 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 the nearest residences, the number of children using the play areas at a given time, and the types of activities the children are engaged in. Therefore, because the project includes park areas in close proximity with nearby residential areas, impacts related noise generated by neighborhood parks would be ***potentially significant***.

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

4.5-5 *During site plan consideration for the parks, the City shall ensure that active recreation areas of neighborhood parks are located as far as possible from residential property lines and masonry walls shall be constructed along property lines adjacent to existing residential uses. In addition, neighborhood parks shall only be open from dawn to dusk. Parks shall be large enough to allow playgrounds to be placed appropriate distances from residences. In addition, new residential developments shall be informed of any planned parks in their vicinity.*

4.5-6 Impacts related to construction noise.

Activities associated with the construction of properties within the project site would result in elevated noise levels, with maximum noise levels ranging from 85-90 dB at 100 feet, as shown in Table 4.5-12. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Table 4.5-12
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.

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. Nonetheless, because construction activities would result in periods of elevated noise levels at nearby sensitive receptors, the

development of the project could result in a ***potentially significant*** impact with regard to construction noise.

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

4.5-6(a) *During construction, the City shall ensure noise-generating activities at the construction site or in areas adjacent to the construction site associated with the project in any way shall be restricted to the hours of 7:30 am to 5:30 pm, Monday through Saturday. Construction is prohibited on Sundays and City holidays unless prior authorization from the Community Development Director is obtained.*

4.5-6(b) *Prior to the approval of the Improvement Plans or initiation of any grading or construction activity, the applicant/developer shall include the following mitigation measures on the plans to be approved by the City Engineer:*

- *Equip all equipment driven by internal combustion engines with intake and exhaust mufflers that are in good condition and appropriate to the equipment. Unnecessary idling of internal combustion engines should be strictly prohibited;*
- *Stationary noise-generating equipment, such as air compressors or portable power generators, must be located the greatest distance applicable from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses;*
- *Utilize "quiet" air compressors and other stationary noise sources where technology exists;*
- *Designate a "disturbance coordinator" who would be responsible for responding to any local complaints regarding construction noise. The disturbance coordinator will determine the cause of the noise complaints (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented; and*
- *Notify prospective residents within the adjacent subdivision that the development of the commercial portion of the site would generate noise levels during construction that may be considered excessive or annoying.*

4.5-7 Impacts related to construction vibration.

Construction of the proposed project could result in temporarily elevated vibration levels during construction. The primary construction activities include the placement of

infrastructure such as buildings and utilities. The threshold for groundborne vibration is one inch per second (in/sec). As shown in Table 4.5-3, one in/sec could cause architectural damage. However, the construction activities resulting in vibrations above the threshold, such as piledriving, are not anticipated to occur. Therefore, the development of the project could result in a ***less-than-significant*** impact with regard to construction vibration.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

As defined in Section 15355 of the State CEQA Guidelines, "cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects (CEQA Guidelines 15355).

An assessment of cumulative impacts should consider impacts identified as significant, as well as impacts identified as less-than-significant for individual projects that may become significant in a collective sense when considering the co-occurrence of multiple projects. The following impact discussion pertains to cumulative impacts associated with the Sciortino Ranch project.

4.5-8 Cumulative impacts as a result of project-related traffic on existing noise-sensitive uses adjacent to the project site.

The noise analysis assumed that under the Cumulative scenario, the SR 4 Bypass would be completed and, as a result, a substantial amount of regional traffic would be re-routed from Brentwood Boulevard to the SR 4 Bypass. Therefore, the future ambient noise environment following cumulative buildout of the area is expected to be defined primarily by current surface traffic. However, due to the increased traffic which would result from the buildout of the area, future traffic noise levels are predicted to be higher than existing traffic noise levels.

Table 4.5-13 shows the predicted traffic noise level increases on the local roadway network for Cumulative and Cumulative Plus Project conditions. Appendix B of the Noise Assessment (See Appendix F of the DEIR) provides the complete inputs and results to the FHWA model for each of the traffic scenarios.

Table 4.5-13
Predicted Cumulative and Cumulative Plus Project Traffic Noise Levels

			Traffic Noise Levels (L_{dn} dBA)			Distance to Contours (feet) Cumulative			Distance to Contours (feet) Cumulative + Project		
Roadway	**Segment**	**Distance[1] (feet)**	**Cumulative**	**Cumulative + Project**	**Change**	**70 L_{dn}**	**65 L_{dn}**	**60 L_{dn}**	**70 L_{dn}**	**65 L_{dn}**	**60 L_{dn}**
Brentwood Blvd.	North of Lone Tree	100	66.3	66.8	0.5	56	121	261	61	131	282
Brentwood Blvd.	Lone Tree to Sunrise	100	66.9	67.7	0.8	62	133	287	70	151	326
Brentwood Blvd.	Sunrise to Gregory	100	67.0	67.8	0.8	63	135	291	71	153	330
Brentwood Blvd.	Gregory to Homecoming	100	66.9	67.7	0.8	62	134	288	71	152	327
Brentwood Blvd.	Homecoming to Grant / Sunset	100	67.1	67.9	0.8	64	137	295	72	155	334
Brentwood Blvd.	Grant / Sunset to Sunset Court	100	67.4	68.2	0.8	67	145	312	75	163	350
Brentwood Blvd.	Sunset Court to Havenwood	100	66.4	67.4	1.0	58	125	269	67	144	309
Brentwood Blvd.	Havenwood to Applewood	100	66.5	67.4	0.9	59	127	273	68	145	313
Brentwood Blvd.	Applewood to Sand Creek	100	66.6	67.5	0.9	59	128	275	68	146	315
Brentwood Blvd.	Sand Creek to Technology	100	66.8	67.6	0.8	61	132	285	69	148	319
Brentwood Blvd.	Technology to Village	100	66.7	67.4	0.7	60	129	278	68	145	313
Brentwood Blvd.	Village to Central / Sycamore	100	66.3	67.1	0.8	57	122	263	64	139	299
Brentwood Blvd.	South of Central / Sycamore	100	65.3	66.2	0.9	49	105	227	56	121	260
Sand Creek Road	Brentwood to O'Hara	100	64.5	65.4	0.9	43	93	200	49	107	230
Sand Creek Road	West of O'Hara	100	65.9	66.6	0.7	53	115	248	59	128	275
O'Hara Ave.	Sand Creek to Saddle Creek	100	64.3	64.3	0.0	42	90	194	42	90	194
Lone Tree	East of Brentwood	100	57.1	57.1	0.0	14	30	64	14	30	64
Lone Tree	West of Brentwood	100	66.5	66.9	0.4	58	125	269	62	135	290
Grant Street	West of Brentwood	100	59.9	59.9	0.0	21	46	99	21	46	99
Sunset Road	East of Brentwood	100	63.1	63.1	0.0	34	74	160	34	74	160
Havenwood Ave.	East of Brentwood	100	52.8	52.8	0.0	7	15	33	7	15	33
Havenwood Ave.	West of Brentwood	100	50.9	50.9	0.0	5	11	25	5	11	25
Sand Creek Road	East of Brentwood	100	54.6	64.9	**10.3**	9	20	44	45	98	211
Central Blvd.	West of Brentwood	100	61.6	62.0	0.4	27	59	127	29	63	135
Sycamore Ave.	East of Brentwood	100	60.0	60.0	0.0	23	49	105	23	49	105

Bold Underline indicates an increase in noise levels exceeding 3 dB.
[1] Distances are reference from centerline of roadway.

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

Existing residences located along major roadways in the vicinity of the project area would be exposed to elevated traffic noise levels under baseline conditions either with or without the project. Table 4.5-13 indicates that traffic noise level increases resulting from the proposed project would range from +0.1 dB to +10.3 dB L_{dn}, for cumulative conditions relative to no-project conditions. The only roadway segment that would experience noise level increases in excess of three dB is along the Sand Creek Road extension. However, the proposed project would implement mitigation to reduce noise impacts to on-site uses from traffic noise along the Sand Creek Road extension. Therefore, the cumulative impacts related to project-related traffic on noise-sensitive land uses would be considered to be ***potentially significant*** without mitigation implemented.

Mitigation Measure(s)

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

4.5-8 Implement Mitigation Measure 4.5-2.

Endnotes

[1] j.c. brennan & associates, Inc. *Environmental Noise Assessment.* December 2, 2008.
[2] City of Brentwood. *City of Brentwood General Plan Update EIR*. June 2001.

4.6 BIOLOGICAL RESOURCES

4.6 BIOLOGICAL RESOURCES

Introduction

The Biological Resources chapter evaluates the biological resources known to occur or potentially occur within the Sciortino Ranch boundary. This chapter describes potential impacts to those resources, and identifies measures to eliminate or substantially reduce those impacts to less-than-significant levels. Existing plant communities, wetlands, wildlife habitats, and potential for special-status species and communities are discussed for the project site. The information contained in this analysis is primarily based on the *Biological Resources Analysis, Sciortino Mixed Use Development*[1] prepared by Mosaic Associates LLC (See Appendix G), the *Memorandum re: Trees at Sciortino Ranch, Brentwood*[2] prepared by Baefsky & Associates, Environmental Consulting (See Appendix H), the *East Contra Costa Habitat Conservation Plan/Natural Community Conservation Plan* (HCP/NCCP),[3] and the *Brentwood Boulevard Draft Specific Plan*.[4]

Existing Environmental Setting

The following sections describe the regional setting of the site, as well as the existing biological resources occurring in the proposed project area.

Regional Setting

The City of Brentwood is located in the eastern valley area of Contra Costa County immediately east of the Diablo Range, on the western edge of the San Joaquin Valley. The City has historically been surrounded by agricultural land uses consisting primarily of row crops, orchards, and grazing lands. The City's planning area is located southeast of Antioch and south of the City of Oakley and Bethel Island. The City of Brentwood's planning area is characterized by the relatively flat terrain of the Central Valley, with a few gently sloping hills in the southern and western portions of the City, near the foothills of the Diablo Range. Elevations in the City of Brentwood range from 25 feet above mean sea level (MSL) in the northeast corner to 492 feet above MSL at the highest peak in the southwest corner. The majority of the soils within the City are formed from alluvial sediment and are moderately to well-drained with slow runoff. In addition, the City of Brentwood is comprised of several ground cover types, including slough/channel, orchard, vineyard, riparian woodland, and urban ground cover.

A series of east-west trending ridges and valleys extend eastward from the Diablo Range toward the San Joaquin Valley. Lone Tree Valley, Deer Valley, and Briones Valley form a set of drainage basins, which collect seasonal rainwater and direct runoff into a network of small streams and creeks in the Brentwood area. Marsh Creek is the largest of the waterways within the City. In the southern portion of Brentwood, Marsh Creek has been dammed to form Marsh

Creek Reservoir. Marsh Creek continues north from the reservoir, passes through the City of Brentwood, and extends north to the Creek's confluence with the San Joaquin River.

Project Setting

The proposed project site occupies approximately 65 acres of nearly flat agricultural land in Brentwood (See Figure 4.6-1, Aerial View of the Proposed Project Site). The site is located east of Brentwood Boulevard (State Route 4) at the Sand Creek Road intersection. Surrounding land uses include commercial and residential development. The proposed project site is surrounded by residential development to the north, east and south with commercial to the west.

Although presently fallow, the project site was previously used for intensive agricultural production. At the time of the reconnaissance survey, approximately 80 percent of the site consisted of fallow cropland. The remainder of the site was occupied by structures and supported limited vegetation. One group of tall trees surrounds a former home site. The perimeter of the project site was disked during the summer of 2006 to abate fire hazards and vegetative cover in the disked strip is limited. At the time the Biological Resources Analysis was prepared, an excavated pit, approximately 15 feet wide and 80 feet long, existed along the east side of the project site. However, this pit is not on the site any longer, as the pit has since been covered with soil. Structures present within the study area include a natural gas pumping station enclosed in a chain-link fence in the northeast corner of the property and two temporary trailers near the former homesite.

<u>On-Site Vegetation Communities</u>

Due to the past use of the site for agriculture, the entire project site is highly disturbed, and as a result, is dominated by ruderal vegetation. Ruderal habitat is habitat from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. Once abandoned, such areas are typically recolonized by invasive exotic species. The native vegetation, if kept from further disturbance or left intact, may ultimately become at least partially restored.

Ruderal species occupy areas within the project site that had not been disked in the months prior to the site reconnaissance. Scattered plants are also found within the disked portion of the site, although to a lesser extent. Ruderal habitat is present on nearly the entire site, where disturbance by disking or road construction activities has not occurred.

Plant species present on-site include dense stands of the non-native grasses wild oat (*Avena fatua)* and ripgut brome (*Bromus diandrus*), as well as mixed stands of milk thistle (*Silybum marianum*) and Italian thistle (*Carduus pycnocephalus*). Other species present included black mustard (*Brassica nigra*), goosefoot (*Chenopodium album*), field bindweed (*Convovulus arvensis*), common malva (*Malva neglecta*), and Russian thistle (*Salsola tragus*). See Table 4.6-1 for a list of plant species observed on-site.

Figure 4.6-1
Aerial View of the Proposed Project Site

Table 4.6-1 Plant and Tree Species Observed on the Proposed Project Site	
Scientific Name	**Common Name**
Alnus rhombifolia	White alder
Avena fatua	Wild oat
Brassica nigra	Black mustard
Bromus diandrus	Ripgut brome
Carduus pycnocephalus	Italian thistle
Chenopodium album	Goosefoot
Convovulus arvensis	Field bindweed
Juglans regia	English walnut
Malva neglecta	Common malva
Nerium oleander	Oleander
Salsola tragus	Russian thistle
Silybum marianum	Milk thistle
Source: Mosaic Associates, LLC, October 2006.	

Developed Areas

An old demolished home site is located east of Brentwood Boulevard and south of the new alignment of Sand Creek Road. Although the structure is not present, several large tree stands exist at the former home site. The trees included are white alder (*Alnus rhombifolia*) and English walnut (*Juglans regia*). In addition, a former natural gas pump station in the northeast corner of the site that was removed in approximately 2007 is surrounded by a paved and graveled yard and fringed with oleander (*Nerium oleander*) shrubs.

An extension of Sand Creek Road east of the present terminus at Brentwood Boulevard has been rough graded and roughly bisects the project site.

On-Site Wildlife Species and Habitat

Mammals

Despite the high level of disturbance, the areas dominated by ruderal vegetation provide habitat for a number of wildlife species, including small mammals such as the California vole (*Microtus californicus*), western harvest mice (*Reithrodontomys megalotis*), deer mice (*Peromyscus maniculatus*), California ground squirrel (*Spermophilus beecheyi*), and jackrabbits (*Lepus californicus*). These small mammals in turn serve as prey for various raptors such as red-tail hawk (*Buteo jamaicensis*) and barn owls (*Tyto alba*), as well as coyotes (*Canis latrans*).

Birds

Birds observed during the site survey included western scrub jay (*Aphelocoma californica*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), Say's phoebe (*Sayornis saya*), and European starling (*Sturnus vulgaris*). Special-status birds observed include a single

burrowing owl in the southern area of the site, and two loggerhead shrikes (*Lanius ludovicianus*). Table 4.6-2, below, lists the mammals and birds observed on-site.

Table 4.6-2
Wildlife Species Observed on the Proposed Project Site

Scientific Name	Common Name
Birds	
Athene cunicularia	Burrowing owl
Aphelocoma californica	Scrub jay
Buteo jamaicensis	Red-tailed hawk
Cathartes aura	Turkey vulture
Lanius ludovicianus	Loggerhead shrike
Sayornis saya	Say's phoebe
Sturnus vulgaris	European starling
Mammals	
Lepus californicus	Jackrabbit
Spermophilus beecheyi	California ground squirrel

Source: Mosaic Associates LLC, October 2006.

Jurisdictional Waters of the United States

Waters of the United States (U.S.), including wetlands, are broadly defined under 33 Code of Federal Regulations (CFR) 328 to include navigable waterways, tributaries of navigable waterways, 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 the California Department of Fish and Game (CDFG) and the U.S. Army Corps of Engineers (USACE) have jurisdiction over modifications to riverbanks, lakes, stream channels, and other wetland features. In addition, jurisdictional Waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." (33 C.F.R. §328.3[e]).

Although definitions vary to some degree, wetlands are generally considered to be areas that are periodically or permanently inundated by surface water or groundwater, supporting vegetation adapted to life in saturated soil. Jurisdictional wetlands are vegetated areas that meet specific vegetation, soil, and hydrologic criteria defined by the USACE *Wetlands Delineation Manual* (USACE, 1987). Waters of the U.S. are drainage features or water bodies as described in 33 CFR 328.4. The USACE 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.

Special-Status Species

Special-status plant species may meet one or more of the following criteria:

- Plants listed or proposed for listing as threatened or endangered under the FESA (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species);
- Plants that are candidates for possible future listing as threatened or endangered under the FESA (64 FR 205, October 25, 1999; 57533-57547);
- Plants that meet the definitions of rare or endangered species under the California Environmental Quality Act (CEQA) (CEQA Guidelines, Section 15380);
- Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered" in California (Lists 1A, 1B, and 2 species in CNPS [2001]);
- Locally important occurrences of plants listed by CNPS as plants for which more information is needed and plants of limited distribution (Lists 3 and 4, respectively, species in CNPS [2001]);
- Plants listed or proposed for listing by the State of California as threatened or endangered under the CESA (14 CCR 670.5);
- Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.). Plants considered sensitive by other federal agencies (i.e., U.S. Forest Service, Bureau of Land Management) or state and local agencies or jurisdictions; and/or
- Plants considered sensitive or unique by the scientific community or occurring at the limits of their natural range (*CEQA Guidelines*, Appendix G).

Special-status wildlife species may meet one or more of the following criteria:

- Wildlife listed or proposed for listing as threatened or endangered under the FESA (50 CFR 17.11 for listed wildlife and various notices in the Federal Register for proposed species);
- Wildlife that are candidates for possible future listing as threatened or endangered under the FESA (54 CFR 554);
- Wildlife that meet the definitions of rare or endangered species under the CEQA (CEQA Guidelines, Section 15380);
- Wildlife listed or proposed for listing by the State of California as threatened and endangered under the CESA (14 CCR 670.5);
- Wildlife species of special concern to the California Department of Fish and Game (Remsen [1978] for birds; Williams [1986] for mammals); and/or
- Wildlife species that are fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

Several species of plants and animals within the State of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the State's human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described below, State and federal laws have provided the CDFG and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the State. A number of native plants

and animals have been formally designated as threatened or endangered under state and federal endangered species legislation. Others have been designated as "candidates" for such listing. Still others have been designated as "species of special concern" by the CDFG. In addition, the California Native Plant Society (CNPS) has developed a set of lists of native plants considered rare, threatened, or endangered (CNPS 2001). Collectively, these plants and animals are referred to as "special-status species."

Sensitive plants are those that are designated rare, threatened, or endangered and candidate species for listing by the 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 4.6-3 provides a summary of the listing status and habitat requirements of sensitive species that have been documented in the project vicinity or for which potentially suitable habitat exists 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 (2006) in the Brentwood topographic quadrangle, and species for which the HCP/NCCP identifies suitable habitat in the proposed project area.

A list of special-status animal species that have been recorded in the vicinity of the project site was generated from a review of the California Natural Diversity Database (CDFG 2006) and the California Native Plant Society Inventory of Rare and Endangered Vascular Plants of California (2001) and reports prepared for other projects in the vicinity. Species that have been recorded in the Brentwood, Antioch North, Antioch South, Tassajara, Byron Hot Springs, Clifton Court Forebay, Woodward Island, Bouldin Island, and Jersey Island topographic quads were considered for their potential to occur on-site. From this list, species that have habitat requirements that are clearly not met on-site (such as species that occur in salt marsh habitats) were excluded from the analysis. A final list was generated that includes those special-status plant and animal species that were assessed for their potential to occur in the project area (See Table 4.6-3). The potential for special-status plant and animal species to occur within the study area was assessed during and after the site reconnaissance.

For Table 4.6-3, definitions of species potential for occurrence on the site are:

- **Present**: Species known to occur on the site, based on CNDDB records, and/or was observed to occur on-site during the field survey(s);
- **High**: Species known to occur on or near the site (based on CNDDB records within five miles, and/or based on professional expertise specific to the site or species) and suitable habitat exists on-site;

- **Moderate**: Species known to occur in the vicinity of the site, and suitable nesting and foraging habitat is present;
- **Low**: Species known to occur in the vicinity of the site, and marginal habitat exists on the site. Or, species are not known to occur in the vicinity of the site, but suitable habitat exists on-site; and
- **None**: Species are not known to occur on or in the vicinity of the site and suitable habitat for the species does not exist on the site. Or, species were surveyed for during the appropriate season with negative results for the species occurrence on the site.

Further analysis is included in this Draft EIR only for species that are known to be present, have a low to high potential for occurrence, or have been noted as present on the project site.

Special-Status Plant Species

Thirty-three special-status plant species occurring in the vicinity of the study area were evaluated for their potential to occur on-site (See Table 4.6-3). The project site has been completely disturbed over many years of agricultural cultivation, and has been fallow for at least two years. As a result, the project site is largely occupied by non-native vegetation in areas not disked for fire control and where the natural gas pumping station is located.

The on-site survey did not detect any special-status plant species. Given the negative findings for the surveys characteristic of a highly disturbed site, and the uniform conditions across the study area, a determination was made that the potential for special-status plant species to occur on site is negligible, and that further botanical surveys are not warranted. However, the survey of the site was performed in 2005 and 2006. Since that time the possibility exists that some of these special-status plant species may have become established on-site.

Special-Status Wildlife Species

Table 4.6-3 includes special-status wildlife species with potential to occur within the project site. Although the site is highly disturbed, the fallow fields, group of tall trees, and ground squirrel burrows provide suitable habitat for several special-status animals. Thirty-one special-status species known from the project area were evaluated to determine the presence of suitable habitat and potential to occur in the study area.

Table 4.6-3
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
PLANTS						
Large-flowered fiddleneck	*Amsinckia grandiflora*	FE, G1	CE, S1.1	1B	Cismontane woodland, valley and foothill grassland.	None. Not detected during 2005 survey.
Mt. Diablo manzanita	*Arctostaphylos auriculata*	G2	S2.2	1B	Chaparral.	None. No suitable habitat present.
Contra Costa manzanita	*Arctostaphylos manzanita ssp. laerigata*	G5T2	S2	1B	Chaparral.	None. No suitable habitat present.
Suisun Marsh aster	*Aster lentus*	G2	S2.2	1B	Marshes and swamps (brackish and freshwater).	None. No suitable habitat present.
Alkali milk-vetch	*Astragalus tener var tener*	G1T1	S1.1	1B	Alkali playa, valley and foothill grassland, vernal pools.	None. No suitable habitat present.
Brittlescale	*Altriplex depressa*	G2Q	S2.2	1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools.	None. No suitable habitat present.
San Joaquin spearscale	*Atriplex joaquiniana*	G2	S2.1	1B	Chenopod scrub, alkali meadow, valley and foothill grassland.	None. No suitable habitat present.
Big tarplant	*Blepharizonia plumosa*	G1	S1.1	1B	Valley and foothill grassland.	None. Not detected during 2005 survey.
Mt. Diablo fairy-lantern	*Calochortus pulchellus*	G2	S2.1	1B	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland.	None. No suitable habitat present.
Bristly sedge	*Carex comosa*	G5	S2	2	Marshes and swamps.	None. No suitable habitat present.
Congdon's tarplant	*Centromadia parryi ssp. congdonii*	G4T3	S3.2	1B	Valley and foothill grassland.	None. Not detected during 2005 survey.
Hoover's cryptantha	*Cryptantha hooveri*	GH	SH	1A	Valley and foothill grassland.	None. No suitable habitat present.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
Recurved larkspur	*Delphinium recurvatum*	G2	S2.2	1B	Chenopod scrub, valley and foothill grassland, cismontane woodland.	None. No suitable habitat present.
Mt. Diablo buckwheat	*Eriogonum truncatum*	G1	S1.1	1B	Chaparral, coastal scrub, valley and foothill grassland.	None. No suitable habitat present.
Round-leaved filaree	*Erodium macrophyllum*	None	None	2	Cismontane woodland, foothill woodland, valley and foothill grassland.	None. Not detected during 2005 survey.
Delta button-celery	*Eryngium racemosum*	G2Q	CE, S2.1	1B	Riparian scrub.	None. No suitable habitat present.
Contra Costa wallflower	*Erysimum capitatum ssp. angustatum*	FE, G5T1	CE, S1.1	1B	Inland dunes.	None. No suitable habitat present.
Diamond-petaled California poppy	*Eschscholzia rhombipetala*	G1	S1.1	1B	Valley and foothill grassland.	None. Not detected during 2005 survey.
Diablo helianthella	*Helianthella castanea*	G3	S3.2	1B	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley & foothill grassland.	None. Not detected during 2005 survey.
Brewer's western flax	*Hesperolinon breweri*	G2	S2.2	1B	Chaparral, cismontane woodland, valley and foothill grassland.	None. No suitable habitat present.
Rose-mallow	*Hibiscus lasiocarpus*	G4	S2.2	2	Marshes and swamps (freshwater).	None. No suitable habitat present.
Contra Costa goldfields	*Lasthenia conjugens*	FE,G1	S1.1	1B	Valley and foothill grassland, vernal pools, cismontane woodland. Extirpated from most of its range; extreme. Endangered.	None. No suitable habitat present.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
Delta tule pea	*Lathyrus jepsonii var. jepsonii*	G5T2	S2.2	1B	Freshwater and brackish marshes.	None. No suitable habitat present.
Mason's lilaeopsis	*Lilaeopsis masonii*	G3	S3.1	1B	Freshwater and brackish marshes, riparian scrub.	None. No suitable habitat present.
Delta mudwort	*Limosella subulata*	G4?Q	S2.1	2	Riparian scrub, freshwater marsh, brackish marsh. Probably the rarest of the suite of delta rare plants.	None. No suitable habitat present.
Showy madia	*Madia radiata*	G2	S2.1	1B	Valley and foothill grassland, cismontane woodland, chenopod scrub.	None. Not detected during 2005 survey.
Antioch Dunes evening-primrose	*Oenothera deltoides ssp. howellii*	FE, G5T1	CE, S1.1	1B	Interior dunes.	None. No suitable habitat present.
Eel-grass pondweed	*Potamogeton zosteriformis*	G5	S2.2?	2	Marshes and swamps.	None. No suitable habitat present.
Marsh skullcap	*Scutellaria galericulata*	G5	S2.2?	2	Marshes and swamps, lower montane coniferous forest, meadows and seeps.	None. No suitable habitat present.
Blue skullcap	*Scutellaria lateriflora*	G5	S1.2	2	Meadows and seeps, marshes and swamps.	None. No suitable habitat present.
Rayless ragwort	*Senecio aphanactis*	G3?	S1.2	2	Cismontane woodland, coastal scrub.	None. No suitable habitat present.
Suisun Marsh aster	*Symphyotrichum lentum*	FSC	None	1B	Freshwater marsh, marshes and swamps.	None. No suitable habitat present.
Caper-fruited tropidocarpum	*Tropidocarpum capparideum*	G1	S1.1	1B	Valley and foothill grassland.	None. Not detected during 2005 survey.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
WILDLIFE						
				Mammals		
San Joaquin pocket mouse	*Perognathus inornatus inornatus*	None	DFG: Special Animal	None	Inhabits grassland and scrub habitats in Central and San Joaquin Valleys.	None. No suitable habitat present.
American Badger	*Taxidea taxus*	None	CSC	None	Drier, open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need adequate food source, and open, uncultivated ground.	None. No suitable habitat present.
San Joaquin kit fox	*Vulpes macrotis mutica*	FE	ST	None	Range includes annual grassland, saltbush scrub and oak savanna at the valley/mountain interface.	None. No suitable habitat resent.
				Birds		
Tricolored blackbird	*Agelaius tricolor*	None	CSC	N/A	Open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of nesting colony.	None. No suitable habitat present.
Golden eagle (nesting and wintering)	*Aquila chrysaetos*	None	CSC	N/A	Rolling foothills, mountain areas, sage-juniper flats, desert. Cliff-walled canyons and large trees in open areas provide nesting habitat.	None. No suitable habitat present.
Burrowing owl	*Athene cunicularia*	None	CSC	N/A	Open, dry, annual or perennial grasslands, deserts, and scrublands, characterized by low growing vegetation. Subterranean nester, dependent upon burrowing mammals.	Present. Observed in study area. Suitable nesting and foraging habitat is present.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
Swainson's hawk (nesting)	*Buteo swainsoni*	FSC	ST	N/A	Nests in isolated trees or in small groves surrounded by agricultural land or grasslands.	Low: Marginal nesting habitat is present in the trees on site.
Northern Harrier	*Circus cyaneus*	None	CSC	N/A	Coastal marsh and freshwater marsh, grassland. Nests on ground near marsh edge.	None. No nesting habitat present on site.
California horned lark	*Eremophila alpestris actia*	None	CSC	N/A	Occurs in open grasslands with low sparse vegetation.	Low. Marginal habitat present.
Loggerhead shrike	*Lanius ludovicianus*	None	CSC	N/A	Nests and forages in isolated small trees and shrubs in open grasslands.	Present. Observed foraging in Study Area. Suitable nesting habitat is present in the scattered trees and shrubs on site.
White-tailed kite (nesting)	*Elanus leucurus*	FSC	None	N/A	Open grasslands, meadows, or marshes for foraging, close to isolated, dense-topped trees for nesting and perching.	Low. Marginal nesting habitat is present in the trees on site.
Cooper's hawk (nesting)	*Accipiter cooperi*	None	CSC	N/A	Deciduous, coniferous, and mixed woodlands, typically near open areas; open woodlands; wooded edges of rivers; occasionally, urban areas.	None. No nesting habitat present on site.
Reptiles and Amphibians						
California red-legged frog	*Rana aurora draytonii*	FT	CSC	N/A	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	None. No suitable habitat present.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
Western pond turtle	*Actinomys marmorata*	None	CSC	N/A	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg laying.	None. No suitable habitat present.
California horned lizard	*Phrynosoma coronatum frontale*	None	CSC	N/A	Inhabits open, sandy areas in grasslands and washes.	None. No suitable habitat present.
Silvery legless lizard	*Anniella pulchra pulchra*	None	CSC	N/A	Inhabits sandy or loose loamy soils under sparse vegetation.	None. No suitable habitat present.
San Joaquin whipsnake	*Masticophis flagellum ruddocki*	None	CSC	N/A	Inhabits open, dry habitats with little or no tree cover. Found in valley grassland and saltbrush scrub. Needs mammal burrows for refuge and oviposition sites.	None. No suitable habitat present.
Alameda whipsnake	*Masticophis lateralis euryxanthus*	FT	ST	N/A	Closely associated with chaparral and rock outcrops.	None. No suitable habitat present.
California tiger salamander	*Ambystoma californiense*	FT	CSC	N/A	Breeds in vernal pools and temporary ponds, aestivates in burrows in grasslands.	None. No suitable habitat present.
Giant garter snake	*Thamnophis gigas*	FT	None	N/A	Inhabits wetlands and waterways including irrigation and drainage canals, slough, ponds, small lakes, low gradient streams, and adjacent uplands.	None. No suitable habitat present.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
Brachiopods						
Longhorn fairy shrimp	*Branchinecta longiantenna*	FE	DFG: Special Animal	N/A	Inhabits small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales.	None. No suitable habitat present.
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT	DFG: Special Animal	N/A	Inhabits small, clear-water depressions in sandstone, astatic rain-filled pools and grassed swales, earth slumps, or basalt-flow depression pools.	None. No suitable habitat present.
Midvalley fairy shrimp	*Branchinecta mesovallensis*	None	DFG: Special Animal	N/A	Inhabits vernal pools.	None. No suitable habitat present.
Vernal pool tadpole shrimp	*Lepidurus packardi*	FE	DFG: Special Animal	N/A	Inhabits vernal pools and grassy swales of unplowed grasslands. Tolerant of mud-bottoms and highly turbid conditions.	None. No suitable habitat present.
Gastropods						
Bridges' shoulderband snail	*Helminthoglypta nickliniana bridgesi*	None	DFG: Special Animal	N/A	Tends to colonize under tall grasses and weeds. Prefers rock piles. Inhabits open hillsides. Recorded from Kensington and in the vicinity of Thousand Oaks in the Berkeley Hills and in San Pablo Creek.	None. No suitable habitat present.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

Common Name	Scientific Name	Federal Status	State Status	CNPS List	Habitat	Potential for Occurrence in the Study Area
Insects and Arthropods						
Andrena blennospermatis	*Andrena blennospermatis*	G2	S2	N/A	A bee that pollinates only one or a few vernal pool plant species.	None. No suitable habitat present.
Lange's metalmark butterfly	*Apodemia mormo lagei*	FE	None	N/A	Inhabits stabilized dunes along San Joaquin River. Endemic to Antioch Dunes, Contra Costa County.	None. No suitable habitat present.
San Joaquin dune beetle	*Coelus gracilis*	G1	S1	N/A	Inhabits fossil dunes along western edge of San Joaquin Valley on sandy substrates.	None. No suitable habitat present.
Antioch efferian robberfly	*Efferia antiochi*	S1	S3	N/A	Known only from Fresno and Contra Costa Counties. Found in Antioch Dunes.	None. No suitable habitat present.
Redheaded sphecid wasp	*Euerceris ruficeps*	G1	S1	N/A	Nest in hard-packed sand in abandoned bee burrows.	None. No suitable habitat present.
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	None	N/A	Found in riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant.	None. No suitable habitat present.

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Table 4.6-3 (continued)
Special-Status Species and Sensitive Natural Communities that Potentially Occur or Were Observed Within the Project Site

CODE DESIGNATIONS

FSC – Federal Species of Concern
FE – Federal Endangered
FT – Federal Threatened
CE – California Endangered
CT – California Threatened
CR – California Rare
CSC – California Department of Fish and Game Species of Special Concern
List 1A – CNPS list of plants that are presumed extinct in California
List 1B – CNPS list of plants rare, threatened, or endangered in California but more common elsewhere
List 2 – CNPS list of plants rare, threatened, or endangered in California but more common elsewhere
List 3 – CNPS list of plants which need more information; a review list
List 4 – CNPS list of plants of limited distribution; a watch list
G1 – Less than 6 variable element occurrences (EOs) or less than 1,000 individuals or less than 2,000 acres.
G2 – 6-20 EOs OR 1,000 – 3,000 individuals or 2,000-10,000 acres.
G3 – 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 – Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 – Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
T-Rank – Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety.
S1 – Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres
- S1.l = very threatened
- S1.2 = threatened
- S1.3 = no current threats known

S2 – 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres
- S2.1 = very threatened
- S2.2 = threatened
- S2.3 = no current threats known

S3 – 21-80 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres
- S3.1 = very threatened
- S3.2 = threatened
- S3.3 = no current threats known

S4 – Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.
S5 – Demonstrably secure to ineradicable in California. NO THREAT RANK.
DFG Special Plant – California Department of Fish and Game special species list.

Source: *Mosaic Associates LLC, October 2006.*

The ground squirrel burrows in the fallow fields of the project site would provide suitable nesting habitat for the burrowing owl (*Athene cunicularia*), a California Species of Special Concern. One burrowing owl was observed during the reconnaissance survey. In addition, two burrowing owls were observed by Mosaic biologists on the property in February and March 2006 during surveys conducted for the adjacent Barrington project. Those owls did not nest on-site, probably due to the height of the vegetation, which exceeded six feet during the spring and early summer. Burrowing owls are ground nesting birds that utilize ground squirrel burrows year round, with the nesting season occurring between February and August and peak nesting activity from mid-April to mid-July. Although burrowing owls have been observed on-site, the height of ruderal vegetation across most of the site limits the suitability of the site for nesting. Perimeter areas of the site where vegetation height has been controlled and ground squirrel burrows are present have a higher potential for burrowing owl nesting. Numerous ground squirrel burrows suitable for burrowing owls are present across the site.

Perimeter areas of the project site where vegetation is sparser provide marginal nesting habitat for the California horned lark (*Eremophila alpestris actia*), a California Species of Special Concern. The trees surrounding the old residential site at the southwest corner of the roadway alignment provide suitable nesting habitat for Swainson's hawk (*Buteo swainsoni*), although the recent development of agricultural fields surrounding the site has substantially reduced foraging habitat for this species. Furthermore, Swainson's hawks were not observed during focused surveys conducted in 2006 for the adjacent Barrington project, which encompassed the proposed project site (Mosaic Associates, April 27, 2006).

The on-site trees provide marginal nesting habitat for the white-tailed kite (*Elanus leucurus*), a California Species of Special Concern and fully protected species, while the smaller trees and shrubs in this area provide suitable nesting habitat for loggerhead shrike (*Lanius ludovicianus*), a California Species of Special Concern. Two loggerhead shrikes were observed during the site visit. The fallow field and trees in the study area provides habitat for other ground and tree-nesting avian species protected by the Migratory Bird Treaty Act.

California tiger salamanders (*Ambystoma californiense*) do not have a potential to occur within the study area due to the intensive agricultural cultivation on the site and adjoining properties. A site assessment for California tiger salamanders prepared for the adjacent Barrington project (Jennings 2005) concluded that a potential does not exist for occurrence of this species and the United States Fish and Wildlife Service concurred with that finding (USFWS 2005). These site conditions have not changed, and thus the finding is still valid. Therefore, the remaining species do not require further analysis.

While some of the birds listed in Table 4.6-3 may occasionally fly over or forage on the site, the site does not provide nesting habitat for species other than Swainson's hawk, burrowing owl, loggerhead shrike, white-tailed kite, and California horned lark. 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. Therefore, the remaining species do not require further analysis.

As Table 4.6-3 indicates, one special-status wildlife species had some record of occurrence in the vicinity of the study area, and is discussed below:

Burrowing Owl

The Migratory Bird Treaty Act and CDFG 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 year-long residents in a variety of grasslands, as well in 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 proposed project area during most years. One burrowing owl was present on-site in September 2006, and two were observed in February and March 2006. Numerous ground squirrel burrows suitable for burrowing owls are present across the site. These site conditions have not changed and the finding is still valid.

Special-Status Natural Communities

Special-status natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (i.e., Sections 404 and 401 of the Clean Water Act, Section 1600 *et seq.* of the California Fish and Game Code, and/or the Porter-Cologne Act). In addition, the CNDDB has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986, CDFG 2003e).

The biological resources report prepared by Mosaic Associates LLC indicates that special-status natural communities are not found within the proposed project site.

Regulatory Context

The following is a description of federal, State, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

Federal

Federal Endangered Species Act

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect endangered species or species that are threatened with extinction. The FESA is intended

to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3). Taking can result in civil or criminal penalties.

The FESA and NEPA Section 404 guidelines prohibit the issuance of wetland permits for projects that would jeopardize the existence of threatened or endangered wildlife or plant species. The U.S. Army Corps of Engineers must consult with the U.S. Fish and Wildlife Service (USFWS) and National Oceanic Atmospheric Administration (NOAA) when threatened or endangered species may be affected by a proposed project to determine whether issuance of a Section 404 permit would jeopardize the species.

Migratory Bird Treaty Act

Raptors (birds of prey), migratory birds, and other avian species are protected by a number of State and federal laws. The federal Migratory Bird Treaty Act (MBTA) prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. Section 3503.5 of the California Fish and Game Code states, "it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

Clean Water Act

The U.S. Army Corps of Engineers regulates discharge of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into waters of the U.S. including, but not limited to, the following: placement of fill that is necessary for the construction of any structure or impoundment requiring rock, sand, dirt, or other material for the structure's construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. §328.2[f]). In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." (33 C.F.R. §328.3[b])

Furthermore, jurisdictional Waters of the U.S. can be defined by exhibiting a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." (33 C.F.R. §328.3[e])

State

California Endangered Species Act

In 1984, the State of California enacted the California Endangered Species Act (CESA), which is similar to the FESA but pertains to State-listed endangered and threatened species. The California Endangered Species Act requires State agencies to consult with the California Department of Fish and Game (CDFG) when preparing California Environmental Quality Act (CEQA) documents to ensure that the actions of the lead agency do not jeopardize the existence of listed species. Lead agencies are directed by CESA to consult with CDFG on projects or actions that could affect listed species. In addition, CESA directs CDFG to determine whether jeopardy would occur, and allows CDFG to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that "overriding considerations" exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The California Endangered Species Act prohibits the taking of State-listed endangered or threatened plant and wildlife species. California Department of Fish and Game exercises authority over mitigation projects involving State-listed species, including those resulting from CEQA mitigation requirements. Taking may be authorized by CDFG if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. In addition, CDFG requires preparation of mitigation plans in accordance with published guidelines.

California Department of Fish and Game (CDFG)

The CDFG exercises jurisdiction over wetland and riparian resources associated with rivers, streams, and lakes under CDFG Code Section 1600 to 1607. The CDFG has the authority to regulate work that will do any one or more of the following:

1) Divert, obstruct, or change the natural flow of a river, stream, or lake;
2) Change the bed, channel, or bank of a river, stream, or lake; or
3) Use material from a streambed.

The CDFG asserts that the jurisdictional area along a river, stream, or creek is usually bounded by the top-of-bank or the outermost edges of riparian vegetation. Typical activities regulated by CDFG under Section 1600-1607 authority include installing outfalls, stabilization of banks, creek restoration, implementing flood control projects, constructing river and stream crossings, diverting water, damming streams, gravel mining, logging operations, and jack-and-boring.

Careful project design, including the minimization of impacts and reduction of hard structure surface area (i.e., minimal amounts of cement or rip-rap), is critical for CDFG approval. The CDFG emphasizes the use of biotechnical or bioengineered creek-related components (emphasis on natural materials, sometimes in conjunction with hard materials) that minimize the need for hard structures in creeks.

CDFG Species of Special Concern

In addition to formal listing under FESA and CESA, plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern" developed by the CDFG. Species whose numbers, reproductive success, or habitat may be threatened are tracked by CDFG in California.

CDFG Birds of Prey Protection

Birds of prey are also protected in California under provisions of the State Fish and Game Code, Section 3503.5, (1992), which states, "it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG.

Waters of the State

Waters of the State, including wetlands, are considered sensitive biological resources and fall under the jurisdiction of the CDFG and the Regional Water Quality Control Board (RWQCB).

The CDFG exercises jurisdiction over wetland and riparian resources associated with rivers, streams, and lakes under California Fish and Game Code Section 1600 to 1616. The CDFG has the authority to regulate work that will substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. California Department of Fish and Game's jurisdictional area along a river, stream or creek is usually bounded by the top-of-bank or the outermost edges of riparian vegetation. Typical activities regulated by CDFG under Section 1600-1616 authority include installing outfalls, stabilizing banks, implementing flood control projects, constructing river and stream crossings, diverting water, damming streams, gravel mining, and logging.

<u>Regional Water Quality Control Board</u>

Pursuant to Section 401 of the Clean Water Act and EPA 404(b)(1) guidelines, in order for a USACE federal permit applicant to conduct any activity which may result in discharge into navigable waters, they must provide a certification from the RWQCB that such discharge will comply with the State water quality standards. The RWQCB has a policy of no-net-loss of

wetlands in effect and typically requires mitigation for all impacts to wetlands before the RWQCB will issue water quality certification.

Under the Porter-Cologne Water Quality Control Act (Cal. Water Code Section 13000-14920), the RWQCB is authorized to regulate the discharge of waste that could affect the quality of the State's waters. Therefore, even if a project does not require a federal permit (i.e., a NWP from the USACE), the project may still require review and approval of the RWQCB, in light of the approval of new NWPs on March 9, 2000 and the Supreme Court's decision in the case of the Solid Waste Agency of Northern Cook County (SWANCC) vs. USACE. The RWQCB in response to this, issued guidance for regulation of discharges to "isolated" water on June 25, 2004. The guidance states:

> Discharges subject to Clean Water Act section 404 receive a level of regulatory review and protection by the USACE and are also subject to streambed alteration agreements issued by the CDFG; whereas discharges to waters of the State subject to SWANCC receive no federal oversight and usually fall out of CDFG jurisdiction. Absent of RWQCB attention, such discharges will generally go entirely unregulated. Therefore, to the extent that staffing constraints require the RWQCB to regulate some dredge and fill discharges of similar extent, severity, and permanence to federally-protected waters of similar value. Dredging, filling, or excavation of "isolated" waters constitutes a discharge of waste to Waters of the State, and prospective dischargers are required to submit a report of waste discharge to the RWQCB and comply with other requirements of Porter-Cologne.

When reviewing applications, the RWQCB focuses on ensuring that projects do not adversely affect the "beneficial uses" associated with waters of the State. Generally, the RWQCB defines beneficial uses to include all of the resources, services and qualities of aquatic ecosystems and underground aquifers that benefit the State. In most cases, the RWQCB seeks to protect these beneficial uses by requiring the integration of water quality control measures into projects that will result in discharge into waters of the State. For most construction projects, RWQCB requires the use of construction and post-construction Best Management Practices (BMPs). In many cases, proper use of BMPs, including bioengineering detention ponds, grassy swales, sand filters, modified roof techniques, drains, and other features, will speed project approval from RWQCB. Development setbacks from creeks are also requested by RWQCB as they often lead to less creek-related impacts in the future.

<u>California Native Plant Society</u>

The California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Plants of California. Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The following identifies the definitions of the CNPS listings:

List 1A:	Plants believed extinct.
List 1B:	Plants rare, threatened, or endangered in California and elsewhere.

List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere.
List 3: Plants about which we need more information - a review list.
List 4: Plants of limited distribution - a watch list.

Natural Community Conservation Program

The Natural Community Conservation Program (NCCP) is an unprecedented effort by the State of California, as well as numerous private and public partners, which takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. The NCCP, which began in 1991 under the California Natural Community Conservation Planning Act, is broader in orientation and objectives than CESA and FESA; these laws are designed to identify and protect individual species that are already listed as threatened or endangered. The primary objective of the NCCP is to conserve natural communities at the ecosystem scale, while accommodating compatible land uses (CDFG, 2003).

Local

East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan

On January 25, 2000, the Contra Costa County Board of Supervisors made a declaration of intent to participate in the development of the East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (HCP/NCCP). On June 30, 2000, the East Contra Costa County Habitat Conservation Plan Association Agreement went into effect. This agreement established the East Contra Costa Habitat Conservation Plan Association (HCPA) as the lead agency in drafting the Habitat Conservation Plan for submittal to the governing boards and councils of member agencies, oversee compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), and would serve as the lead agency under CEQA for developing the HCP/NCCP. The City of Brentwood elected to participate in the development of the HCP/NCCP and is a member of the HCPA.

The City of Brentwood approved the HCP/NCCP and authorized execution of the Implementation Agreement and Joint Exercise of Powers Agreement on January 22, 2007 (Resolution No. 12-07). The U.S. Fish and Wildlife Service signed the federal permit for the HCP/NCCP on July 25, 2007, and the CDFG signed the State permit for the HCP/NCCP on August 6, 2007. Therefore, East Contra Costa County has an officially approved HCP/NCCP as of August 6, 2007. Currently, all participating jurisdictions have approved the HCP/NCCP and have adopted implementing ordinances and the fee structures set forth in the HCP/NCCP. At present, all jurisdictions are expected to have adopted ordinances in place by January 15, 2008. The City of Brentwood approved the Ordinance (16.168) to implement the East Contra Costa HCP/NCCP on October 9, 2007.

Based on the HCP/NCCP and the data and analyses referenced therein, there is a reasonable relationship between the use of the HCP/NCCP implementation fees authorized by the City of Brentwood implementation ordinance and the type of development projects subject to the fees. All development is subject to the fees, except those exempted under Ordinance 16.168.030(A).

Among the exemptions are development projects that would permanently disturb less than one acre, and development that is contained entirely within an area mapped as urban, turf, landfill and/or aqueduct land cover types in the HCP/NCCP (See Figure 4.6-2). The Development Fee is used to implement the HCP/NCCP by funding the acquisition of land, the enhancement and management of habitat and the other activities to mitigate for impacts to open space, habitat and covered species caused by affected development projects. The Wetland Mitigation Fee is used to implement the HCP/NCCP by funding the restoration, creation and management of Jurisdictional Wetlands and Waters and riparian woodland/scrub and other actions in order to mitigate for impacts to Jurisdictional Wetlands and Waters and riparian areas caused by affected development projects. The HCP/NCCP implementation fees do not apply to all types of development projects, but only those that impact open space, habitat suitable for one or more covered species, Jurisdictional Wetlands and Waters, or riparian areas. In this way, the HCP/NCCP implementation fees are used only for purposes reasonably related to the types of development projects that will be subject to the fees.

The proposed project site is within the HCP/NCCP inventory area. The HCP/NCCP development fee is based on the project location. The HCP/NCCP includes three Fee Zones, defined by a map that determines the fee paid by development, regardless of the land cover type within the development. The Sciortino Ranch project is within the HCP/NCCP Development Fee Zone I: Cultivated and Disturbed Lands. Land within this zone is generally dominated by cultivated agriculture but also includes undeveloped areas within the existing urban areas of Pittsburg, Brentwood, and Oakley. The development fee in Zone I is $12,078 per acre, as of March 2008.

The proposed project's participation in the above-mentioned East Contra Costa County HCP/NCCP would provide a mechanism to adequately mitigate impacts to all potentially occurring sensitive species on the proposed project site.

City of Brentwood General Plan

In addition to federal and State regulations, the City of Brentwood General Plan identifies the following goals and policies to provide further protection to biological resources within the City's limits:

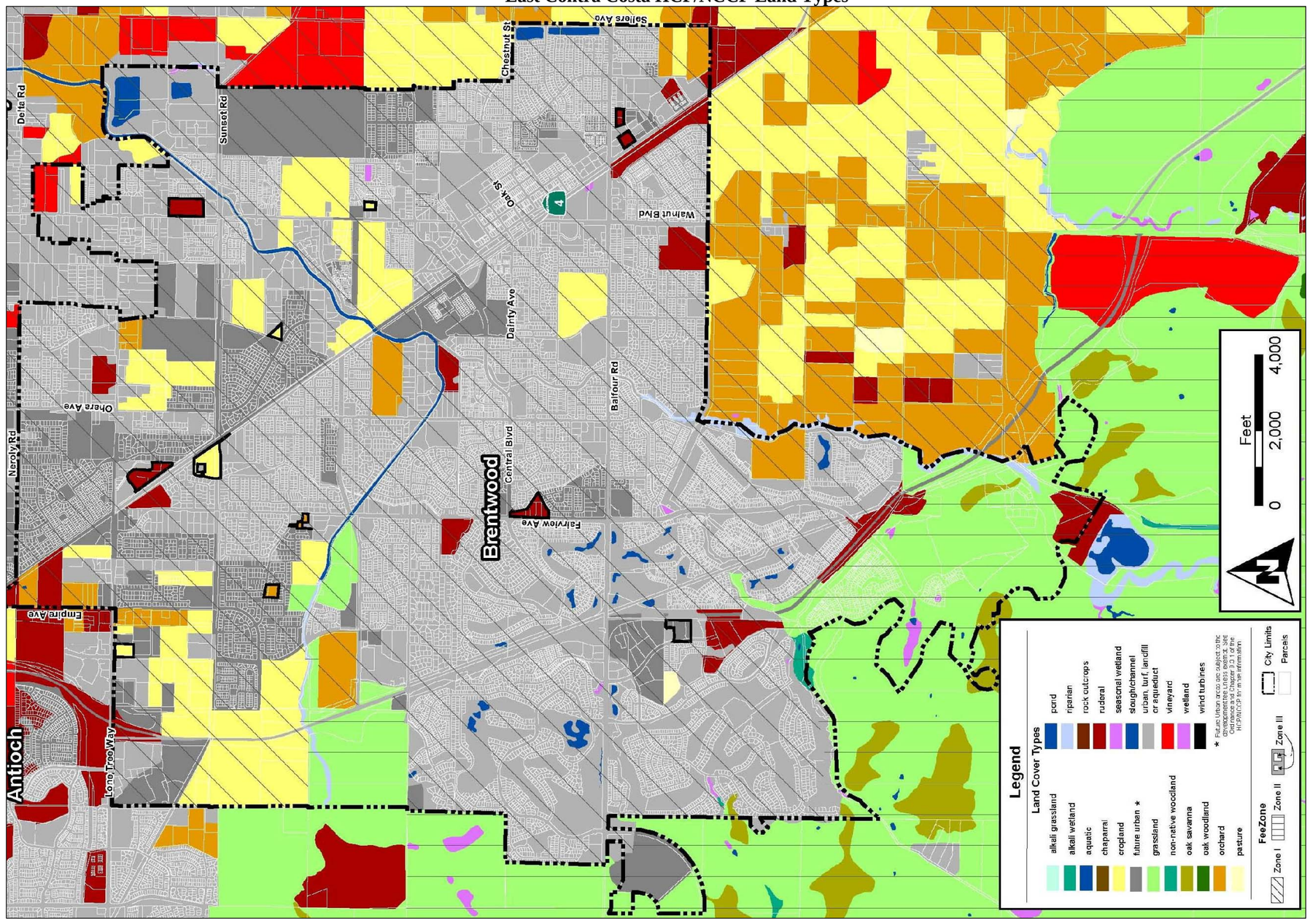
Goal 7 Natural Resources – Protect the Brentwood Planning Area's natural resources.

- Policy 7.2 Preserve Vegetation – Preserve vegetation and associated wildlife habitat in the Brentwood Planning Area.
- Policy 7.3 Waterways – Maintain and improve wildlife and plant values along waterways and within flood control facilities.

Goal 8 Open Space – Preserve and enhance natural open space in and around the Brentwood Planning Area.

- Policy 8.1 Open Space Planning – Promote the preservation of open space and natural features through land use planning and development proposals.

Figure 4.6-2
East Contra Costa HCP/NCCP Land Types



Impacts and Mitigation Measures

Standards of Significance

For the purposes of this EIR, the following standards of significance were adapted from Appendix G of the CEQA Guidelines. Impacts are considered significant if implementation of the proposed project would do any one or more of the following:

- Adversely affect, either directly or through habitat modification, any endangered, threatened or rare species, as listed in Title 14 of the California Code of Regulations (Sections 670.5) or in Title 50, Code of Regulations (Sections 17.11 or 17.12) or their habitats (including but not limited to plants, fish, insects, animals, and birds);

- Have a substantial adverse impact, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the CDFG or USFWS, including CNPS plants listed as 1B;

- Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulation or by the CDFG or USFWS;

- Allow development that would be inconsistent with the City's General Plan goals and policies associated with biological resources;

- Allow development that would be inconsistent with other City plans, policies, or ordinances associated with biological resources;

- Adversely affect federally protected wetlands (including but not limited to, marsh, vernal pool, coastal, etc.), either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means;

- Have a substantial adverse effect on significant ecological resources including:

  - Wetland areas including vernal pools;
  - Large areas of non-fragmented natural communities that support endangered, threatened or rare species;
  - Wildlife movement zones, including but not limited to, non-fragmented stream environment zones, avian and mammalian routes, and known concentration areas of waterfowl within the Pacific Flyway;

- Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites;

- Conflict with any local or regional policies or ordinances designed to protect or enhance biological resources, such as a tree preservation policy or ordinance;

- Substantially fragment, eliminate or otherwise disrupt foraging areas, access to food sources, range and/or movement;

- Disrupt critical time periods (i.e., nesting and breeding) for fish and other wildlife species; or

- Conflict with an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, State, or federal resource conservation plans, goals, or regulations that would result in a physical impact on the environment.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish or result in the loss of an important biological resource, or those that would obviously conflict with local, State, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important, but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, the impacts would not substantially diminish or result in the permanent loss of a defined important resource on a population-wide or region-wide basis.

Method of Analysis

The report by Mosaic Associates LLC is based on a review of biological resource databases, inventories, regional literature on both plants and animals, and a reconnaissance-level field survey that was conducted at the project site on September 27, 2006. In addition to the site assessment, focused botanical surveys of the Sand Creek Road alignment on the Sciortino property were conducted on April 21 and August 2, 2005 (Wood Biological, August 10, 2005).

Sources of information used in the preparation of this analysis include the CNDDB, the California Native Plant Society Inventory of Rare and Endangered Vascular Plants (2001), manuals and references related to plants and animals of the region (CDFG 2003 a,b,c,d,e), and reports prepared for other projects in the region. Potential impacts to biological resources and proposed mitigation measures are based on the project description derived from draft site development plans and discussions with the project applicant.

Project-Specific Impacts and Mitigation Measures

4.6-1 Impacts to jurisdictional waters of the United States and waters of the State.

The report prepared by Mosaic Associates, LLC for the project site does not give evidence of any Waters of the State or jurisdictional Waters of the United States being present. Therefore, a ***less-than-significant*** impact would result.

Mitigation Measure(s)
None required.

4.6-2 Impacts to special-status plants.

Thirty-three special-status plant species occurring in the region surrounding the proposed project were assessed for their potential to occur on-site. Although, due to the highly disturbed nature of the site and absence of special-status species in focused botanical surveys of the Sand Creek Road alignment, suitable habitat for these species is absent. However, because the surveys were conducted in 2005 and 2006, a possibility exists that some of these special-status plant species may have become established on-site. Therefore, disturbance of the site during construction could have a ***potentially significant*** impact.

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

4.6-2 *Prior to the issuance of grading permits, the applicant shall ensure that a pre-construction survey for special-status plant species is conducted prior to commencement of construction activities, for the review and approval of the Community Development Director and the California Department of Fish and Game. The survey is to be done to verify the continued absence of special-status plant species identified in the previous surveys.*

4.6-3 Impacts to burrowing owl.

A single burrowing owl was present on-site in September 2006, and two were observed in February and March 2006. Construction of the project has the potential to result in a "take" of burrowing owls if they are present on-site at the time of construction, and would result in the loss of occupied burrowing owl habitat. This would be considered a ***potentially significant*** impact.

Mitigation Measure(s)
The proposed project's participation in the East Contra Costa County HCP/NCCP would provide a mechanism to adequately mitigate impacts to burrowing owl. The following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.6-3(a) *Prior to the issuance of grading permits, the applicant shall ensure that pre-construction surveys are conducted between April 15 and July 15 by a qualified biologist within the project area to determine the presence of burrowing owls during the height of the nesting season. The survey is to be completed in accordance with the survey requirements of the CDFG and protocol for the California Burrowing Owl Consortium (CBOC) and submitted to the Community Development Director. If site disturbance*

does not commence within 30 days of the nesting season survey, an additional survey shall be conducted prior to construction.

If site disturbance commences during the nesting season, between February 1 and August 31, and burrowing owls are detected on or within 250 feet of the on-site construction areas, a fenced buffer shall be installed not less than 250 feet between the nest burrow(s) and construction activities. The 250 foot buffer shall be observed and the fence left intact until a qualified biologist determines that the young are foraging independently, the nest has failed, or the owls are not using any burrows within the buffer.

4.6-3(b) *Prior to the issuance of grading or construction permits for the project site, the applicant shall pay the applicable HCP/NCCP per-acre fee in effect. Once the per-acre fee is paid, the City will verify that the HCP/NCCP permit terms and conditions have been met and issue take authorization under the HCP/NCCP.*

4.6-4 Impacts to Swainson's hawk.

The trees on site provide suitable nesting habitat for Swainson's hawk, although the potential for this species to nest on the site is low given the limited area of foraging habitat in the vicinity of the study area. Construction of the project has the potential to disrupt nesting behavior if occupied nests are present on or near the site. A ***potentially significant*** impact would result.

Mitigation Measure(s)
The proposed project's participation in the East Contra Costa County HCP/NCCP would provide a mechanism to adequately mitigate impacts to Swainson's hawks. The following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.6-4 *Prior to the issuance of grading permits, the applicant shall ensure that pre-construction surveys are conducted between February and August by a qualified biologist within the project area and within a 0.5 mile radius of the project boundary. If nests are not found during the pre-construction survey, further action is not required, other than payment of HCP/NCCP mitigation fees, and required compliance with HCP/NCCP Mitigation Measure 4.6-3(b). If active nests are found, the findings shall be submitted to CDFG and a buffer zone of a minimum of one-quarter mile shall be established around the active nest. Intensive new disturbances, such as heavy equipment activities associated with construction that may cause nest abandonment or forced fledging, shall not be initiated within this buffer zone between March 1 and September 1. Any trees containing nests that must be removed as a result of project implementation shall be removed during non-breeding season between September and January.*

4.6-5 Impacts to nesting raptors and other migratory birds.

The trees and ruderal vegetation on-site provide suitable nesting habitat for several special-status species including California horned lark, loggerhead shrike, and white-tailed kite. Of these special-status species, the loggerhead shrike was observed during the survey conducted by Mosaic Associates LLC in 2006. Other special-status species with a high potential to occur within the HCP/NCCP area include the golden eagle and tri-colored blackbird. Buildout of the project site has the potential to cause the failure of occupied nests. In addition, trees located on the project site could be potential nesting sites for raptors and migratory birds. Removal of the trees during the nesting season could result in adverse impacts to raptors and migratory birds. Therefore, a ***potentially significant*** impact would result.

Mitigation Measure(s)
The proposed project's participation in the East Contra Costa County HCP/NCCP would provide a mechanism to adequately mitigate impacts to nesting raptors and other migratory birds. The following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.6-5 *If site disturbance commences during the nesting season (February 1 through August 15), a pre-construction survey shall be conducted by a qualified wildlife biologist within 15 days of the start of project-related activities. If nests are not found during the pre-construction survey, further action is not required, other than payment of HCP/NCCP mitigation fees, and required compliance with Mitigation Measure 4.6-3(b). If nests of migratory birds are detected on site or within 75 feet (for migratory passerine birds) or 250 feet (for birds of prey) of the site, the applicant shall observe no-disturbance buffers of 75 feet for migratory passerine and 250 feet for birds of prey until August 15, or the qualified biologist determines that the young are foraging independently, or the nest has been abandoned.*

Removal of any potential nesting trees or shrubs shall occur between September 1 and January 31, outside of the general avian nesting season. If removal of any potential nesting trees or shrubs occurs, or construction begins, between February 1 and August 31 (nesting season for passerine or non-passerine land birds) or December 15 and August 31 (nesting season for raptors), the applicant shall have a nesting bird survey performed. The survey shall be done for the review and approval of the Community Development Director, by a qualified biologist within 14 days prior to the removal or disturbance of potential nesting trees or shrubs, or the initiation of other construction activities during the early part of the breeding season (late December through April) and not more than 30 days prior to the initiation of these activities during the late part of the breeding season (May through August). During this survey, a qualified biologist shall inspect all potential nesting habitat (trees, shrubs,

grasslands, pastures, etc.) in and immediately adjacent to the impact areas for nests.

Active nests shall be flagged and an appropriate non-disturbance buffer zone shall be established around the nesting trees or shrubs. The size of the buffer zone shall be determined by the project biologist in consultation with CDFG and will depend on the species involved, site conditions, and type of work to be conducted on the project site. Typically, if active nests are found, construction activities shall not take place within 250 feet of the raptor nests and within 75 feet of other migratory birds until the young have fledged. A qualified biologist shall monitor active nests to determine when the young have fledged and are feeding on their own. The qualified biologist and CDFG shall be consulted for clearance before construction activities resume on the project site.

4.6-6 Impacts related to interference with the movement of native wildlife.

The proposed project is surrounded on all sides by development, not allowing for native wildlife to use the area as a "movement corridor," although some species may use the project site to move on or through the area. Therefore, the project would not have an effect on home range and dispersal movements of native wildlife present in the site vicinity, resulting in a ***less-than-significant*** impact on the movement of native wildlife.

Mitigation Measure(s)
None required.

4.6-7 Impacts related to conflicts with local policies and ordinances.

The Brentwood General Plan includes adopted goals and policies regarding the protection of natural resources in the Brentwood Planning Area. In addition, the City of Brentwood recently approved the East Contra Costa County HCP/NCCP, which is intended to provide an effective framework to protect natural resources in eastern Contra Costa County, while improving and streamlining the environmental permitting process for impacts on endangered species. Furthermore, the Sciortino Ranch project is consistent with the urban development planned for the project site.

While limited vegetation exists on-site and the site provides habitat for a few special-status species, the project site would not conflict with the goals or policies in the Brentwood Planning Area. In addition, the applicant would be required to adhere to the goals and policies found in the regulatory context section in this chapter of the EIR. Furthermore, the proposed project will be required to adhere to the HCP/NCCP by paying development fees for the applicable Development Fee Zone. Therefore, a ***less-than-significant*** impact would occur.

Mitigation Measure(s)
None required.

4.6-8 Impacts to existing trees.

According to the arborist report prepared by Baefsky & Associates for the proposed project site, a total of 79 trees within and adjacent to the proposed project site were located on an aerial photograph, identified as to their species, and measured and evaluated in terms of health/vigor and structural soundness. Within the approximately 65-acre project site, 23 trees were measured at 4.5 feet above grade and evaluated. The existing trees on-site range from dead to fair condition, and include the following species: Fruitless mulberry, Purple leaf plum, Aleppo pine, Siberian elm, Almond, and Apricot. None of the trees on-site are oak trees. Along Brentwood Boulevard, 56 City-maintained street trees were assessed, measured, and identified as to their species. The street trees were found to range from fair to good condition, and include the upright variety of European hornbeam and the non-native Virginia oak.

It should be noted that the *Draft Sciortino Ranch Design Guidelines* include requirements for both commercial and residential development that are intended to provide and preserve open space, parks, trees, and landscaping. The development requirements related to landscaping are intended to ensure that existing mature healthy trees are preserved and incorporated into the proposed development, where feasible, and to ensure that any trees that are removed are replaced elsewhere in the area at a two-to-one ratio.

Development of the proposed project site could result in the removal of existing trees. In addition, any trees to be retained could be damaged if not properly cared for both during construction and thereafter. As a result, implementation of the proposed project would result in a ***potentially significant*** impact to trees.

<u>Mitigation Measure(s)</u>
The following mitigation measure would reduce impacts on non-orchard trees to a *less-than-significant* level.

4.6-8 *Prior to deeming complete site-specific applications for parcels located within the proposed project site, the site plan(s) shall identify all non-orchard trees within the site plan area that are at least in "good" condition (based on the arborist report prepared for the project site), which shall be protected from damage, to the satisfaction of the Community Development Department, and shall be identified on the grading plan. Appropriate protective measures shall be taken to ensure preservation during grading activity and after project occupancy. Any non-orchard tree in at least "good" condition that cannot be preserved in place shall be relocated or replaced, to the satisfaction of the Community Development Department.*

Cumulative Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in combination with other proposed and pending projects in the region.

4.6-9 Cumulative loss of biological resources in the City of Brentwood and the effects of ongoing urbanization in the region.

As defined in Section 15355 of the State CEQA Guidelines, "cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects (CEQA Guidelines 15355).

An assessment of cumulative impacts should consider impacts identified as significant, as well as impacts identified as less-than-significant for individual projects that may become significant in a collective sense when considering the co-occurrence of multiple projects.

The Brentwood area, like other communities in the Bay Area, has experienced urban growth over the last few years. Several housing developments are already approved or planned in the surrounding areas. Cumulatively, these projects would reduce common wildlife habitat and the numbers of special-status plant and animal species. The majority of the Sciortino Ranch area is highly disturbed as a result of past use of the site for agriculture. However, disturbed lands provide habitat for many common species and may provide habitat for several special-status species.

The Brentwood General Plan EIR concludes that cumulative habitat losses within the Brentwood Planning Area could endanger the continued survival of the species present in the Planning Area and those potentially occurring in the Planning Area. The General Plan EIR also states (p. 3.9-30) that individual projects may be capable of mitigating impacts to special-status species and habitats; however, the loss of habitat within the region would still be cumulatively considerable and, therefore, would represent a significant impact pursuant to CEQA. However, implementation of mitigation included in the General Plan EIR requiring cooperation in the development of an HCP with surrounding jurisdictions would reduce cumulative impacts to a less-than-significant level. As detailed above, the East Contra Costa County HCP/NCCP has been adopted by the City of Brentwood.

The Brentwood General Plan EIR notes that cumulative impacts associated with the buildout of the Brentwood Planning Area could have a significant impact on special-status species and sensitive habitats, especially apparent in the southern portion of the Planning Area. The proposed project is located east of Brentwood Boulevard at the Sand Creek Road intersection, and according to the biological resources report prepared for the project, does not provide high quality habitat for most species. However, implementation of the proposed project could result in a loss of habitat for burrowing owl, Swainson's hawk, and other special-status plant and animal species. Consistent with the conclusions of the General Plan EIR, cumulative development, including the proposed project, would have ***potentially significant*** cumulative impacts on biological resources.

Mitigation Measure(s)

The proposed project's participation in the East Contra Costa County HCP/NCCP would provide a mechanism to adequately mitigate impacts to potentially occurring sensitive species listed in the HCP/NCCP. Impacts to species not covered under the East Contra Costa County HCP/NCCP would be mitigated to a less-than-significant level with the mitigation measures required in this chapter. Therefore, the following mitigation measure would reduce the above impact to a *less-than-significant* level.

4.6-9 Implement Mitigation Measures 4.6-1 through 4.6-8.

Endnotes

[1] Mosaic Associates LLC. *Biological Resources Analysis, Sciortino Mixed Use Development*. October 2006.

[2] Baefsky & Associates, Environmental Consulting. *Memorandum re: Trees at Sciortino Ranch, Brentwood*. October 4, 2006.

[3] East Contra Costa County Habitat Conservation Plan Association. *East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan.* October 2006.

[4] City of Brentwood. *Brentwood Boulevard Draft Specific Plan*. November 29, 2007.

4.7 CULTURAL RESOURCES

4.7 CULTURAL RESOURCES

Introduction

The Cultural Resources chapter describes cultural resources known to be located on the project site. Prehistoric resources are sites and artifacts associated with indigenous, non-Euroamerican populations, generally prior to contact with people of European descent. Historical resources include structures, features, artifacts, and sites that date from Euroamerican settlement of the region. The extent to which development of the proposed project could remove, damage, or destroy existing historic or prehistoric resources is evaluated.

Information presented in this chapter is taken from the *City of Brentwood General Plan*,[1] the *City of Brentwood General Plan EIR*,[2] and *The Results of a Cultural Resource Evaluation of the Sciortino Ranch Project* prepared by Archaeological Resource Service (ARS) (See Appendix I).[3]

Existing Environmental Setting

The following environmental setting discussion for the proposed project consists of a background discussion, a description of the project site, a historic overview of the project location, and overviews of the existing cultural and historical resources in the project area.

Background

The need for a cultural resource assessment for the proposed project is based on the findings and recommendations given in a cultural resource study conducted by an archaeologist and historian, who were part of a larger program-level study that was initiated in 2007. That earlier study was incorporated into the Brentwood Boulevard Specific Plan (BBSP) Draft EIR, which was completed in April 2008. The previous cultural resource study indicated that conducting more detailed analysis to assess potential project-level impacts to cultural resources would be necessary for any projects located within the BBSP area. Therefore, because the proposed project site is located within the BBSP area, a project-level cultural resource evaluation is necessary to assess possible impacts from development.

<u>Archaeological Sensitivity</u>

Given the general environmental setting, the project site lies in a relatively moderate to highly conducive environmental setting for aboriginal occupation. While the project site itself has never been examined prior to this investigation, the majority of adjoining land parcels and the State Route (SR) 4/Brentwood Boulevard right-of-way have been examined. The earliest inspection was conducted in 1974 and encompassed the right-of-way of SR 4 extending north to south east of the town center; the archaeological study was prepared by Caltrans archaeologist Margaret

Buss. Evidence of archaeological materials was not discovered along that section of the highway bordering the proposed project site.

In addition, other properties that border the project site have been studied, including Subdivision No. 6665 located to the south of the project site. Subdivision No. 6665 is a part of the Garin Ranch Specific Plan area that was evaluated by the archaeological firm of Peak and Associates in 1990. Across Brentwood Boulevard to the west is another development, part of the Sand Creek Business Center (APN 016-110-023, -024, and -028), that was evaluated and inspected by archaeologists in 1999. Furthermore, along the southeast and northeast sides of the project site are several other areas that have previously been evaluated. Subdivision 6200 is located to the north and Subdivisions Nos. 9096 and 8548 are located to the southeast. In the case of Subdivision 8548 (APN 016-190-008), the property was initially examined by Basin Research Associates in 2000 and then evaluated again in 2004 by archaeologist Ric Windmiller as part of the Barrington planned residential development.

Historic Overview

The City of Brentwood appears to have been named for the town of Brentwood in Essex, England, from where the family of Dr. John Marsh originally came. The township's history begins nearly a half century earlier when the landgrant was under the ownership of several different Mexican-era families, including Jose Miguel and Antonio Mesa, who applied in 1836 for the Los Medanos land grant. The same year an application was made for the Canada de los Vaqueros Rancho by Mirando Higuera and Alviso, who settled there, and the Rancho Los Meganos was granted to Sr. Jose Noriega. In 1837, Noriega sold the Rancho to Dr. John Marsh, who settled at the Rancho that year and stayed until 1856. During his tenure on the Rancho Los Meganos grant, Marsh first built and lived in an adobe that was followed by the "stone house" that still exists.

Begun in the late nineteenth century as an agricultural section of the county, Brentwood was transformed from an area where grain and hay was raised to an orchard and vegetable district, where in the author's opinion, "an almost limitless variety of high quality fruits and vegetables" were grown. The change in the landscape began when the Balfour-Guthrie Company acquired large areas of choice land and started the company's development with Brentwood as the base of operations. A modern irrigation system was constructed to take water from the San Joaquin River and distribute the water through a series of canals and pumping stations to the entire area.

Commercial planting of trees by the Balfour and Guthrie, Inc. company began on a large scale in 1921; in that year two experimental orchards of apricots were established. Hundreds of additional acres of land were cultivated in the following years, with the following trees being planted: apricots, peaches, prunes, cherries, nectarines, and other fruit varieties. Commercial vegetable growing commenced at the same time, due in great part to the favorable and abundant supply of water that was available, the mild climate and long growing season, combined with the fertile soil. Tomatoes, lettuce, beans, peas, spinach, and cucumbers all were being grown in the valley. In 1922, other companies followed Balfour and Guthrie, Inc. including William T. Kirkman, D. D. Watson, H. P. Garin & Co., and others who established orchards in the Brentwood area and in the greater Diablo Valley.

The City of Brentwood was incorporated in 1948. While the City remained a predominantly rural agricultural community, the post-war population boom in the Bay Area changed the economic focus of the entire region. People could live in the Brentwood area and commute to factory jobs in Pittsburgh and Martinez; as a consequence, communities like Brentwood, Oakley, and Knightsen expanded.

Many of the parcels in Brentwood that have been selected for recent development have been traditionally used for agriculture or other non-residential or minor-scaled commercial applications. Consequently, the likelihood is low that structures of older construction will persist and thus be available for evaluation when a rural parcel is taken out of cultivation and proposed for development.

The proposed project site currently is a vacant agricultural field. A brief review of the history of land usage of the surrounding properties that have been evaluated by archaeologists or historical consultants indicates that very few of them contained buildings or structures that would have warranted an inspection in the past. However, the more stringent application of the California Environmental Quality Act (CEQA) Guidelines pursuant to properties that appear to be greater than 45 years of age requires that an historic evaluation be performed.

Ethnography

According to cultural resource consultants such as Colin Busby who have worked in Brentwood, the ethnographic affiliation of the aboriginal inhabitants of the general area at the time of European contact recently have been designated on the basis of linguistic evidence as belonging to the Bay Miwok (a sub-group of the Penutian family of languages which were widely spoken throughout the interior Central California region). The following is a direct quote from Busby:

> The Bay Miwok occupied the Diablo locality (as called by Bennyhoff (1961)), which includes Mount Diablo and the surrounding interior drainage region, the southern shore of Suisun Bay, and the Delta Region northwest of Mount Diablo. The Bay Miwok included the (tribelets known as the) Saklan (also spelled Saclan), Chupunes, Tarquines, Julpunes, and Ompines (Schenck 1926; Cook 1955) of which the last four groups are located within the (East/Central Contra Costa Wastewater) project boundaries. On the basis of early Spanish reports and mission records, Cook (1955: 64) estimated a population of 3,000 for the four groups and a total population of 9,350 for the tribes known to inhabit the delta region and the southern shore of Suisun Bay. This population was dispersed into many small villages or "tribelets" each having a loosely centralized organization around a principle (sic) village headed by a hereditary chief and a well defined territory for hunting, fishing, and gathering.
>
> Ethnographic information concerning these Indians is fragmentary and incomplete consisting mainly of baptismal records, brief vocabularies taken by the mission padres as well as explorers' and military accounts of the late 18th and early 19th centuries. Although no village names definitely assignable to these groups appear in the mission records, the San Francisco and San Jose missions drew on this portion of the delta region for "converts." Due to the missionizing efforts of the Spanish, it appears that by 1800 these groups, along with neighboring tribes, were virtually extinct having been decimated by disease, military conflict, disintegration of native lifestyles and probably widely scattered from their original aboriginal

> areas so that by the American period only scattered survivors remained. Consequently, very little direct information is available concerning the aboriginal lifestyle. However, some general statements may be offered as a brief sketch of native lifestyles in the delta region of Central California.

In regard to the subsistence practices of the native inhabitants, the Bay Miwok are known to have exploited the native shellfish of the area, which included mussels, clams, and other genera as well as anadromous fish (salmon and steelhead trout) and other near-shore marine species. The principal means of fishing was by nets. Various species of wild fowl that lived in the marshes also were taken by net and via the use of decoys. Deer, as well as rabbits, squirrels and other small game, was hunted in the hills and valleys. In earlier times before the native environment was heavily affected by the historic and modern landscape alterations, other large game animals also were hunted including pronghorn antelope, elk, and brown and/or grizzly bears. However, the larger game animals may have been hunted and their meat eaten for food, although they were apparently exploited for other uses as well. For instance, the skins of grizzly bears were worn as garments and the pelts of bobcats or mountain lions might have been used to store arrows that would be used for hunting. Men were accustomed to go naked when the weather permitted, and women wore skirts of deerskin, shredded tule, or bark fiber along with robes of woven rabbitskin that served both as cloaks and bedding. Men often painted their bodies with earthen pigments and facial tattooing was customary among women. Shell ornamentation was common to both sexes and circular clam shell beads were strung and utilized as items of value in trade networks. The aboriginal inhabitants made coiled and twined baskets; willow was the only plant that was definitely known to have been used in basket making by these groups from the Delta. Other types of basketry materials were used by other tribes who lived in the North Bay area.

Prehistoric Setting

The following observations have been made about the prehistoric setting of the Brentwood area based on a review of the major reference documents that have been prepared about known archaeological (aboriginal) and ethnographic settlement patterns:

> Most of the prehistoric archaeological sites in the Delta region are located on Piper sand dunes, which are situated slightly above the Delta peat and mud. These dunes were probably formed between 40,000 and 10,000 years ago, when the present-day Delta region was part of the river valley of the Sacramento and San Joaquin Rivers. When sea level rose approximately 11,000 years ago, the San Francisco Bay flooded and slowed the flow of these two river systems. The steady accumulation of sediments formed the Delta marshland and buried much of the Piper sand formation, laving only some of the dunes partially exposed (Holson etal. 1993). Prior to the reclamation of the marshland during the mid to late 1800's the Delta consisted of a mosaic of ecological zones including freshwater wetlands, riparian woodlands, and valley grasslands. Prehistoric populations are known to have exploited the plant and animal resources available in these varied habitats. Fish, turtles, and waterfowl were caught with nets, while rabbits, rodents, deer, elk, and other fur-bearing mammals were hunted using spears or bows and arrows. Tules were used to weave mats and to construct houses and canoes for travel between islands. Acorns, roots, nuts, and seeds were gathered for food (Maniery and Syda 1988 in Wick 2007a).

Although earlier use of the Delta area is suspected, any evidence of this occupational usage is likely buried beneath river alluvium and peat deposits and, thus, not easily observable given typical land alteration and modifications that occurred in the historic and modern eras. The earliest evidence of use of the Delta area, known as the Early Period, dates from approximately 2,500 B.C. to 1,000 B.C. This period is characterized by occupational deposits containing shell ornaments, charmstones, large projectile points with concave bases and stemmed points, baked clay cooking balls, fishing implements (harpoons and spears), and various kinds of grinding tools. Burials were usually extended, face down, and oriented to the west.

Middle Period sites, which date from about 1,100 B.C. to A.D. 500, often overlie these earlier sites and consist of midden (culturally modified soil) deposits with shell, mammal and fish bone, charcoal, and grinding tools. Burials during this time were in a flexed, rather than extended, position. The Middle Period is also marked by an increase in the use of obsidian for tool manufacture, as well as an increased variety in shell (taxa) and the types of beads made from shell, which indicates an increase in the complexity of exchange networks and social stratification, as compared to what was seen during the Early Period.

The Late Period (also known as the Hotchkiss Tradition for a major burial site complex that was discovered within the Hotchkiss Island District in the Delta) dates from approximately A.D. 500 to A.D. 1800, which is when the Spanish entered the area and disrupted the aboriginal patterns of subsistence and settlement. This period is characterized by village sites with large pit-houses located on high ground, and an increase in salmon fishing and the processing of acorns and various nuts. Toward the end of the Late Period, cremation burial becomes a more common mortuary practice than inhumation. Small, convex-based, side notched projectile points, which indicate the use of the bow and arrow, and small serrated projectile point forms also become common during this time period. The presence of clam shell disc beads and glass trade beads indicates that the inhabitants participated in an extensive exchange system with other tribal groups operating in the East or Southern Bay Area.

Recorded prehistoric sites are not located within a one- to two-mile radius of the project site and only two isolated finds have been discovered during the studies of evaluated properties in the project vicinity; the discovery of these two lone artifacts was specifically mentioned in two of the reports that were examined in preparation of the cultural resource evaluation. The near absence of recorded sites may reflect an incomplete sample or the difficulty that has been experienced by archaeologists when making an attempt to find evidence of an exposed well-developed midden soil or concentrated scatter of stone tools on the present ground surface. The presence of aboriginal or protohistoric village sites or activity areas may be especially difficult to see, especially after the formerly undulating land surface has been leveled for intensive agriculture or covered by structures, pavements, or fill soil.

While few surface-visible prehistoric sites have been identified during surveys in the marshes and wetlands of the Delta and the islands along the southern shore of the Carquinez Straits, deeply buried archaeological sites with midden deposits and associated mortuary features have been found in the Hotchkiss Tract as discussed above. In other areas, numerous reported examples exist of so-called “isolated” chipped and ground stone implements, as well as ritual or ceremonial ornaments made of shell, stone, or bone, having been found during past historic-era

land leveling operations and in construction activities undertaken for modern residential development projects.

Existing Cultural Resources

This section includes a discussion of the existing cultural resources within the proposed project site.

Archival Review

The archival review found that the project site has moderate archaeological sensitivity; this is based on the site's environmental setting (including proximity to Marsh Creek, which is a known sensitive natural resource) and review of the reports on other evaluated properties in the area which exhibit similar physical settings.

Specific Records Search

According to the Cultural Resource Evaluation, the goal of the archival review was to identify if any existing archaeological site or historic resource had previously been identified within the project site and adjacent parcels, or within any property with a physical location or environmental setting that is highly similar. The assumption was made by ARS that many of the recent residential or commercial developments that have been proposed in the Brentwood Planning Area have been evaluated by consultants to determine the environmental impacts of specific projects (on potential cultural resources).

As discussed in the Existing Environmental Setting section of this chapter, the proposed project site is located within the BBSP area; therefore, ARS reviewed the Draft EIR prepared for the BBSP area as part of the archival review. It should be noted that the *Brentwood Boulevard Specific Plan Draft EIR* indicates that "certain properties" within the Northern, Central, and Southern sub-areas of the BBSP area should be visually inspected in their entirety by a qualified archaeologist. (Several parcels were specifically listed as deserving scrutiny and are demarcated on Figure 4.7-4 of the *Brentwood Boulevard Specific Plan Draft EIR*.) The selection criterion used to guide which properties would be selected for visual inspection for archaeological resources (once proposed for future development) seems to be those with the closest physical proximity to the eastern bank of Marsh Creek. However, the larger two parcels within the proposed project site were not specifically identified as potentially having high historic or archaeological value, or outlined as being suitable for evaluation when proposed for later development.

A separate "windshield" survey of Historic Architectural Resources was conducted in September 2007 for the BBSP area; the results of this evaluation are summarized in the *Brentwood Boulevard Specific Plan Draft EIR*. Out of the 41 vacant parcels within the BBSP area, the survey for Historic Architectural Resources identified a total of 75 buildings. According to the Draft EIR, 26 of these buildings are more than 50 years old and, therefore, warranted an evaluation to rate their historic eligibility. The assessment was based on visual qualities, age, and

whether the building retained historic integrity. It should be noted that none of the 26 structures exist on the proposed project site.

Archival Review Summary

Although a relatively large number of archaeological reports were examined during preparation of the Cultural Resource Evaluation, ARS concluded that identified cultural resources, either prehistoric archaeological sites or registered historic resources, are not located within a quarter-mile radius of the proposed project site. One or two newly recognized historic resources, such as the Contra Costa aqueduct and former trestles used by the railroads, are located in the general vicinity of the site, but none of these historic resources would be impacted by implementation of the proposed project.

A few minor rural (or vernacular style) homes and farms have been identified outside the proposed project site and were inspected and formally recorded, but none were found to be eligible historic resources under State or federal criteria. A similar negative result is indicated for the slightly expanded one to two mile general search area, despite the presence of a few farm structures of greater than 45 years of age that were evaluated. All of the archaeological researchers whose documents were reviewed for this evaluation considered the general area to have a moderate sensitivity for prehistoric occupation. However, within this search area, prehistoric-era archaeological sites have not been identified during any surface inspection or test excavation that was conducted.

Only two instances exist in which an isolated and assumed prehistoric artifact was discovered; the first in the arbitrary one-mile search radius, and the second just outside that radius but with a highly similar environmental setting (i.e., near a known stream). In the arbitrarily defined search radius, a single isolated prehistoric flake of weathered native Franciscan chert was discovered; this isolate was found on the surface of a tilled field that was formerly used for agricultural purposes. This isolated artifact was discovered during the study of the 85-acre parcel that was examined for the proposed Sunset Industrial Park near the City's municipal sewage facilities; Marsh Creek borders this industrial facility. Other items were not found even though an exhaustive search was made by the archaeologist, who prepared a Primary Record form on this isolated find.

In preparation of the Cultural Resource Evaluation, ARS incorporated data, where appropriate, from the archaeological and historical studies that were summarized in the *Brentwood Boulevard Specific Plan Draft EIR*. However, it should be noted that the proposed project site: 1) does not contain standing structures and, thus, was not evaluated by the historian and 2) is located outside the limits of the properties considered to have the highest archaeological sensitivity. The project site is not located along the channel of Marsh Creek and is not on the west side of Brentwood Boulevard; thus, the site does not have the highest sensitivity.

<u>Cultural Resource Surface Examination</u>

Based on recommended procedures from earlier studies, ARS determined that a physical inspection of the project site should be performed, with the purpose of determining if any

prehistoric or historic archaeological materials are present on the surface of the site and if the potential exists for cultural materials to be found during future underground construction.

The cultural resource surface examination was conducted in November 2008 by ARS. The Cultural Resource Evaluation indicates that the northern half of the project site (north of the planned Sand Creek Road extension) was actively being de-vegetated at the time, and a large pile of soil stored at the northeast section of the property was being redistributed. A large amount of the soil was being placed along the north side of the Sand Creek Road extension. As a result of the de-vegetation, the soil visibility was approximately 95 percent.

The area south of the Sand Creek Road extension was covered with low-lying non-native grasses, and east-west oriented furrows were still present from past cultivation of the property. The presence of furrows on the site indicates that, in recent years, the land was cultivated in a field crop. The furrows observed south of the road extension indicate that a field crop was cultivated in that area as well. The soil visibility in this area was reduced to approximately 20 percent due to the vegetation. The soil across the parcel was a medium brown sandy clay loam containing numerous small rocks. The surveyors also observed small pieces of black plastic, as well as modern debris including PVC pipe, plastic, bottle glass, and one small, square building tile. A fenced off natural gas well was present along the eastern portion of the project site.

A location south of the Sand Creek Road extension and east of Brentwood Boulevard contains three concrete slab foundations, a few walnut and fruit trees, and some scattered domestic debris. This material occurs across an area measuring approximately 450 feet east-west by 175 feet north-south. It appears that three structures were present at this location as early as 1968 (USGS Brentwood quadrangle map), but their original construction date is unknown. As indicated by the aerial photos from the City of Brentwood's Map Room, the structures were removed by 2002. The foundations were photographed and measured so that a Primary Record form could be prepared. These former buildings appear to be greater than 45 years of age and, thus, might be considered eligible as historic resources under the criteria of the State of California Office of Historic Preservation (OHP).

The westernmost foundation included a rectangular pad with a square patio and a cement circular walkway that appears to be from a former residence. The rectangular portion measures 54 feet east-west by 17 feet north-south. The patio consists of several four-by-four foot square concrete sections and measures 25 feet east-west by 28 feet north-south. The cement walkway runs from the south side of the patio and curves around to the east side. The other two foundations appear to have been from outbuildings. The foundation east of the former residence measures 34 feet east-west by 24 feet north to south and has a concrete slab foundation containing some minimal rebar that was observed in the concrete. Given the shape, the foundation may have been from a garage. The other foundation is located immediately to the north and east of the former garage. That foundation measures 42 feet east-west by 40 feet north-south and has a perimeter foundation with a poured concrete slab. In addition, some domestic-type materials were observed around these foundations, including a rusted bicycle, a bike tire, a corrugated metal sheet, metal equipment parts, utensils, one tile, plastic, a few articles of clothing, a bed frame, pane glass, bottle glass, and a chain-link gate.

Prehistoric resources, either sites or isolated artifactual materials, were not observed during the cultural resource surface examination. In addition, discoveries have not been made on any of the adjoining properties that have been examined. Both current and prior records searches conclude that a slight potential exists for prehistoric archaeological materials to be found during construction, particularly in deeply buried native alluvial soil deposits that are likely to be uncovered.

Regulatory Context

Federal, State, and local governments have developed laws and regulations designed to protect significant cultural resources that may be affected by actions that they undertake or regulate. The National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA) are the basic federal and State laws governing preservation of historic and archaeological resources of national, regional, State, and local significance.

Federal Regulations

The following are the federal environmental laws and policies relevant to the CEQA review process.

Section 106 for the National Historical Preservation Act (NHPA) of 1966

Federal regulations for cultural resources are governed primarily by Section 106 of the NHPA of 1966. Section 106 of NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties and affords the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The Council's implementing regulations, "Protection of Historic Properties," are found in 36 Code of Federal Regulations (CFR) Part 800. The goal of the Section 106 review process is to offer a measure of protection to sites, which are determined eligible for listing on the National Register of Historic Places. The criteria for determining National Register eligibility are found in 36 CFR Part 60. Amendments to the Act (1986 and 1992) and subsequent revisions to the implementing regulations have, among other things, strengthened the provisions for Native American consultation and participation in the Section 106 review process. While federal agencies must follow federal regulations, most projects by private developers and landowners do not require this level of compliance. Federal regulations only come into play in the private sector if a project requires a federal permit or if it uses federal funding.

State Regulations

The following are the State environmental laws and policies relevant to the CEQA review process for cultural resources.

California Environmental Quality Act (CEQA)

State historic preservation regulations affecting this project include the statutes and guidelines contained in the California Environmental Quality Act (CEQA; Public Resources Code Sections

21083.2 and 21084.1 and Sections 15064.5 and 15126.4 (b) of the CEQA Guidelines). The California Environmental Quality Act requires lead agencies to carefully consider the potential effects of a project on historical resources. "Historical resources" include, but are not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant (Public Resources Code Section 5020.1). Section 15064.5 of the CEQA Guidelines specifies criteria for evaluating the importance of cultural resources, including:

- The resource is associated with events that have made a significant contribution to the broad patterns of California history;
- The resource is associated with the lives of important persons from our past;
- The resource embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of an important creative individual or possesses high artistic values; or
- The resource has yielded, or may be likely to yield, important information in prehistory or history.

Advice on procedures to identify such resources, evaluate their importance, and estimate potential effects is given in several agency publications, such as the series produced by the Governor's Office of Planning and Research (OPR).[4] The technical advice series produced by OPR strongly recommends that Native American concerns and the concerns of other interested persons and corporate entities including, but not limited to, museums, historical commissions, associations, and societies be solicited as part of the process of cultural resources inventory. In addition, State law protects Native American burials, skeletal remains, and associated grave goods regardless of the antiquity and provides for the sensitive treatment and disposition of those remains.[5]

<u>California Historic Register</u>

The State Historic Preservation Office (SHPO) also maintains the California State Register of Historic Resources (CRHR). Properties that are listed on the National Register of Historic Properties (NRHP) are automatically listed on the CRHR, along with State Landmarks and Points of Interest. The CRHR can also include properties designated under local ordinances or identified through local historical resource surveys.

<u>Senate Bill (SB) 18</u>

Senate Bill 18, effective September 2004, requires cities and counties to notify and consult with California Native American Tribes about proposed adoption of, or changes to, general plans and specific plans for the purpose of protecting Traditional Tribal Cultural Places ("cultural places"). The proposed project falls under the SB 18 requirements as defined by OPR; therefore, the tribes included on the list supplied by the Native American Heritage Commission have been contacted.

Local Regulations

The following are the local government environmental goals and policies relevant to the CEQA review process.

Brentwood General Plan

The City of Brentwood established the following General Plan goals and policies regarding cultural and historical resources.

Community Design Element

Goal 3 Small Town Identity. Preserve and enhance the identity and small town character of Brentwood.

Policy 3.1 Maintain Rural Character: Maintain and enhance the architectural character and rural heritage of the existing downtown area and the Brentwood community as a whole.

Conservation/Open Space Element

Goal 2 Cultural Resources. Preserve and enhance prehistoric, historic, and cultural resources in and around the Brentwood Community.

Policy 2.1 Historic Structures: Retain and maintain historic structures.

Policy 2.2 Archaeological Preservation: Preserve archaeological resources that are known to the community.

Impacts and Mitigation Measures

Standards of Significance

The standards of significance for a project's impact on cultural resources include standards related to both archaeological resources and historical resources.

Archaeological Resources

A project could have a significant effect on the environment if it would cause a substantial adverse change in the significance of an archaeological resource or disturb any human remains. Pursuant to Section 15064.5 of the *CEQA Guidelines*, archaeological resources not otherwise determined to be historical resources may be significant if they are unique. Pursuant to Public Resources Code (PRC) Section 21083.2, a unique archaeological resource is defined as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, a high probability exists that it meets one of the following criteria:

- Contains information needed to answer important scientific questions and a demonstrable public interest exists in that information;
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

According to Section 15064.5 of the CEQA *Guidelines*, all human remains are significant. A non-unique archaeological resource means an archaeological artifact, object, or site that does not meet the above criteria. Non-unique archaeological resources do not receive further consideration under CEQA.

Historical Resources

Section 15065 of the CEQA *Guidelines* mandates a finding of significance if a project would eliminate important examples of major periods of California history or pre-history. In addition, pursuant to Section 15064.5 of the CEQA *Guidelines*, historical resources (including both built environment and prehistoric archaeological resources) shall be considered by the lead agency to be historically significant if listed on the California Register of Historical Resources (CRHR) or determined to be eligible for listing by the State Historical Resources Commission. Historical resources may also be considered significant if the lead agency determines, based on substantial evidence, that the resources meet the criteria for inclusion in the CRHR. Any resources that are listed on or considered eligible for inclusion on the National Register of Historic Places are automatically considered eligible for the CRHR.

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

- A property must be significant at the local, State, or national level, under one or more of the following four criteria of significance:
    - 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;
    - The resource is associated with the lives of persons important to the nation or to California's past;
    - 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; or
    - 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);
- The resource retains historic integrity (defined below); and
- The resource 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, the property must retain enough historic character or appearance to be recognizable as a 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. A property must retain most of these qualities to possess integrity; however, one of the qualities of integrity may be more important than another, depending on why the resource is significant.

Method of Analysis

Determinations of impacts to cultural resources were based on information from the *City of Brentwood General Plan*, the *City of Brentwood General Plan EIR*, and *The Results of a Cultural Resource Evaluation of the Sciortino Ranch Project* prepared by ARS. Based on information in the above documents, the standards of significance for cultural resources are identified and assessed against the existing conditions to determine the impacts. Lastly, mitigation measures are proposed, if necessary.

Cultural Resources Surface Examination

The proposed project site was surveyed by ARS on November 25, 2008. The survey was performed by conducting east-west oriented transects with approximately 30-meters of separation between transects, starting at the north end.

Archival Review

For the archival review, ARS examined all available archaeological studies on properties within close proximity to the project site, including the program-level work performed in 2007 by Holman and Associates and Ward Hill, Historical Consultant, for the *Brentwood Boulevard Specific Plan Draft EIR*. Over 70 studies were referenced by ARS in preparation of the Cultural Resource Evaluation – a list of these references is included in the Cultural Resource Evaluation, which is Appendix I of this Draft EIR.

The initial archival review for the project included an examination of standard reference documents, including report files on properties that have been the subject of archaeological evaluation in Contra Costa County (as well as neighboring Alameda County). The files also contain copies of topographic and historic reference maps, which show areas within a particular county that may have been evaluated by professional archaeological and/or historical consultants; particular attention was given to evaluated properties that are part of commercial or residential development or public works projects. The archival review performed by ARS sought details about the prehistory, ethnography, history, and general physical environment of eastern Contra Costa County and the larger Sacramento Delta region to the north. Particular interest was centered on gathering information about what is known about the history of land use in the project area (east Brentwood) and properties in the immediate surroundings starting from the mid nineteenth century to the present.

The archival review was supplemented with pertinent documents acquired from the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS). The NWIC is the repository for reports and map data showing the locations of surveyed properties and recognized cultural resources located in Contra Costa County. The NWIC also places upon these base maps the locations of prehistoric and historical archaeological sites and historical resources (structures or buildings) that have been identified and officially recorded as a result of any archaeological or historic evaluations. In addition to the information compiled from the NWIC search, ARS consulted with other consultants working in Contra Costa County, particularly in the Brentwood area, regarding archaeological sites and historic resources.

Native American Heritage Commission

The proposed Brentwood Boulevard Specific Plan falls under Senate Bill 18 (SB 18) requirements, as defined by the Governor's Office of Planning and Research (OPR). Because SB 18 requires cities and counties to notify and consult with California Native American Tribes about proposed adoption of, or changes to, general plans and specific plans, three Native American tribes identified by the Native American Heritage Commission (NAHC) were contacted regarding the proposed project. The three identified tribes were sent letters informing the tribes about the proposed project and requesting that the tribes provide any comments or concerns regarding the project. As of this writing, responses from the tribes have not been received.

All of the acquired data were examined to prepare a cultural resource overview about the specific project area and the general vicinity. Based on the results of the overview and/or archaeological site record forms, the archaeological sensitivity of the project site was assessed.

Project-Specific Impacts and Mitigation Measures

4.7-1 Disturbance or destruction of archaeological resources on the project site.

The Brentwood General Plan EIR does not indicate known sites of archaeological significance at the proposed project site. However, given the prehistory of the Brentwood area, the proposed project site could have been occupied or traversed by the Bay Miwok tribe at any point during the time the Miwoks were present in the area (approximately 1100 A.D. to 1770 A.D.). Based on previous data and conclusions drawn by the Brentwood General Plan, it may be concluded that much of the Brentwood Planning Area has a low-to-moderate sensitivity for the presence of prehistoric sites.

As discussed in the Existing Cultural Resources section of this chapter, the proposed project site has moderate archaeological sensitivity, based on the site's environmental setting. Artifacts that are typically found associated with prehistoric sites include humanly modified stone, shell, bone or other cultural materials such as charcoal, ash and burned rock indicative of food procurement or processing activities. Prehistoric domestic features include hearths, firepits, or house floor depressions whereas typical mortuary features are represented by human skeletal remains. Historic artifacts potentially include all by-products of human land use greater than 50 years of age.

The records search performed by ARS indicates that most, if not all, of the adjacent properties in the area of the proposed project site have been evaluated through a literature search and, if deemed to have archaeological sensitivity, through an actual archaeological inspection. Although the Northwest Information Center did not have records of archaeological sites located in the immediate project vicinity and potentially significant cultural resources were not found within the project area during the cultural resource surface examination conducted by ARS, the possibility exists that previously unknown resources could be discovered on the project site. Given the moderate archaeological sensitivity of the project site and the proximity of the site to Marsh Creek, buried prehistoric archaeological deposits could occur within or near the project site. Therefore, construction activities associated with buildout of the proposed project could uncover undocumented cultural resources. Should areas containing evidence of prehistoric or historic period activity, such as buried hearths, areas of discolored sediment containing shell, broken fragments of silicate rock, bone, or concentrations of historic period (greater than 45 years old) refuse or features be uncovered, a ***potentially significant*** impact could result.

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

4.7-1(a) *During ground disturbance activities, if any earth-moving activities uncover any concentrations of stone, bone or shellfish, any artifacts of these materials, or any evidence of fire (ash, charcoal, fire altered rock, or earth), all work shall be halted in the vicinity of the find and a qualified archaeologist shall be contacted immediately to make an evaluation to assess possible historic importance or prehistoric significance. If warranted by the discovery of a concentration of artifacts or soil deposits, further work in the discovery area shall be monitored by an archaeologist.*

If the discovery appears to be an isolated find, monitoring of excavation in the vicinity would be appropriate to confirm this. However, if the discovery appears indicative of a more complex deposit, archaeological investigation shall be undertaken and a limited subsurface test procedure (auger test) shall be performed in the discovery location to determine if any culturally modified soils or more concentrated artifactual remains are present at greater depths.

4.7-1(b) *In the event that any archaeological deposits are discovered during construction or grading, work in the vicinity of the discovery shall be halted until a plan has been submitted to the Community Development Director for the evaluation of the resource, as required under current CEQA Guidelines. In addition, the following standard archaeological monitoring and spot check procedures shall be implemented in the vicinity of the discovery, following an investigation that determines that potentially significant discoveries have been made:*

- *Monitoring shall consist of directly watching the major excavation process. Monitoring shall occur during the entire work day, and shall continue on a daily basis until a depth of excavation has been reached at which resources could not occur. This depth is estimated as usually about five feet below grade at the beginning of the project, but may require modification in specific cases, and shall be determined by the monitoring archaeologist based on observed soil conditions. Spot checks shall consist of partial monitoring of the progress of excavation over the course of the project. During spot checks, all spoils material, open excavations, recently grubbed areas, and other soil disturbances shall be inspected to determine if cultural materials are present. The frequency and duration of spot checks shall be based on the relative sensitivity of the exposed soils and active work areas. The monitoring archaeologist shall determine the relative sensitivity of the parcel.*

- *If prehistoric human interments (human burials or skeletal remains) are encountered within the native soils of the parcel, all work should be halted in the immediate vicinity of the find. The County Coroner, project superintendent, and the Agency Liaison shall be contacted immediately.*

- *If significant cultural deposits other than human burials are encountered, the project shall be modified to allow the artifacts or features to be left in place, or the archaeological consultant shall undertake the recovery of the deposit or feature. Significant cultural deposits are defined as archaeological features or artifacts that associate with the prehistoric period, the historic era (Mission and Pueblo Periods), and the American era up to about 1950.*

- *Whenever the monitoring archaeologist suspects that potentially significant cultural remains or human burials have been encountered, the piece of equipment that encounters the suspected deposit shall be stopped, and the excavation inspected by the monitoring archaeologist. If the suspected remains prove to be non-significant or non-cultural in origin, work shall recommence immediately.*

  If the suspected remains prove to be part of a significant deposit, all work shall be halted in that location until appropriate recordation and (possible) removal has been accomplished. If human remains (burials) are found, the County Coroner shall be contacted to evaluate the discovery area and determine the

context; not all discovered human remains reflect Native American origins. However, in all cases where prehistoric or historic era Native American resources are involved, the Native American Heritage Commission shall be contacted to designate appropriate representatives of the local Native American community, who also should be contacted about their concerns.

- *Equipment stoppages shall only involve those pieces of equipment that have actually encountered significant or potentially significant deposits, and should not be construed to mean a stoppage of all equipment on the site unless the cultural deposit covers the entire building site.*

- *During temporary equipment stoppages brought about to examine suspected remains, the archaeologist shall accomplish the necessary tasks with all due speed.*

4.7-1(c) *During construction, if bone is uncovered that may be human, the California Native American Heritage Commission, located in Sacramento, and the Contra Costa County Coroner shall be notified. Should human remains be found, all work shall be halted until final disposition by the Coroner. Should the remains be determined to be of Native American descent, the Native American Heritage Commission shall be consulted to determine the appropriate disposition of such remains. In addition, a qualified archaeologist shall be notified immediately so that an evaluation of the remains and the site can be performed.*

4.7-2 Impacts to historical structures.

According to the Cultural Resource Evaluation, three concrete slab foundations from buildings that were likely greater than 45 years of age were observed in one area of the proposed project site, as well as some walnut and fruit trees and domestic material. Based on the layout of the foundations and the associated debris, the structures appear to be remnants of a residence, possibly a garage and second outbuilding, that likely date from the 1940s.

Because the foundations are likely greater than 45 years of age, they were evaluated using criteria established in the California Environmental Quality Act (CEQA) (14 CCR 15064.5 and PRC 21084.1). These features do not appear to meet the criteria to be considered significant historic resources and do not appear eligible for listing on the California Register of Historic Resources. The foundations are not likely associated with events that have made a significant contribution to the broad patterns of our State or local history (CRHR, Criterion 1) and, although the history of the structures and the structures' past occupants were not researched, the likelihood is low that the structures were associated with the lives of persons important in our past (CRHR, Criterion 2). In addition, the structures do not embody the distinctive characteristics of a type, period, or

method of construction, represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (CRHR, Criterion 3). Furthermore, the structures have not yielded, and are not likely to yield, information important in history (CRHR, Criterion 4).

In addition to having to meet at least one of the four criteria listed above, buildings, sites, structures, objects, and districts representative of California and United States history, architecture, archaeology, engineering, and culture convey significance when they also possess integrity of location, design, setting, materials, workmanship, feeling, and association. While the existing foundations on the proposed project site do appear to retain integrity of location, the foundations have lost all other elements of integrity. Overall, the foundations do not retain the necessary integrity to convey significant information about the past. However, because the foundations and associated materials are greater than 45 years of age and are likely to be removed with implementation of the proposed project, they were recorded on Department of Parks and Recreation (DPR) forms to document the past use of the property. The Primary Record form is provided as an appendix to the Cultural Resource Evaluation and will be sent to the CHRIS for formal designation.

Because the proposed project site does not include any structures that meet the criteria to be considered significant historic resources, and the structures do not have the potential to be eligible for listing on the California Register of Historic Resources, the project would result in a ***less-than-significant*** impact to historical resources.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

4.7-3 Disturbance or destruction of previously unknown archaeological resources in combination with other development in the Brentwood area.

Buildout of approved and planned uses such as the Sciortino Ranch project, as well as other projects within the City of Brentwood, has the potential to uncover previously unknown resource sites. Each resource site is a unique contributor to the overall scientific understanding of a region's pre-history. Evaluation of cultural finds and resources within their original context is a critical component of the resources' value. According to the Brentwood General Plan EIR, the Brentwood Planning Area has a low-to-moderate sensitivity for the presence of recorded sites and a moderate-to-high sensitivity for historic sites. Disturbance, movement, and destruction of such resources would remove or preclude the analysis of the resource within the resource's origin and would, therefore, adversely affect the understanding of the development of human cultural history. Increased population and intensified land use patterns associated with cumulative growth could also increase the potential for vandalism and/or inadvertent destruction of such resources. Consequently, the Brentwood General Plan EIR found that cumulative development would create a significant impact to cultural resources. However, with the

implementation of General Plan goals and policies related to the protection of cultural resources, the General Plan found the cumulative impact to be less-than-significant.

The Cultural Resource Evaluation prepared by ARS did not find any recorded prehistoric or archaeological deposits in the area researched; however, given the sensitivity for the presence of prehistoric and historic sites, buildout of the proposed project could contribute to cumulative impacts related to historic or prehistoric resources if previously unidentified cultural resources are discovered during construction. Therefore, cumulative impacts associated with implementation of the proposed project would be ***potentially significant***.

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

4.7-3 Implement Mitigation Measures 4.7-1(a) through 4.7-1(c).

Endnotes

[1] *City of Brentwood, General Plan, 2001-2021*, November 2001 (updated to reflect amendments through January 2006).
[2] *City of Brentwood, General Plan Update EIR*, June 25, 2001.
[3] Archaeological Resource Service, *The Results of a Cultural Resource Evaluation of the Sciortino Ranch Project*, January 9, 2009.
[4] *CEQA and Archaeological Resources*, State of California, Governor's Office of Planning and Research, 1994.
[5] California Health and Safety Code Section 7050.5, California Public Resources Code Sections 5097.94, *et seq.*

4.8 HAZARDS

4.8 HAZARDS

Introduction

The Hazards chapter of the EIR describes existing and potentially occurring hazards and hazardous materials on the project site. The chapter discusses potential impacts posed by these hazards to the environment, as well as to workers, visitors, and residents within and adjacent to the project site. More specifically, the chapter describes potential effects on human health that could result from soil or groundwater contamination stemming from past uses of the site, or from exposure to hazardous materials used in adjacent agricultural operations. The Hazards chapter is based on information drawn from the *City of Brentwood General Plan Update*,[1] the *City of Brentwood General Plan Update EIR*,[2] Contra Costa County Health Services, Hazardous Materials Program,[3] *Phase I Environmental Assessment* prepared by AEI Consultants (See Appendix J),[4] *Summary Letter – Portion of Sciortino Property* (See Appendix K), prepared by AEI Consultants,[5] and the *Geotechnical Feasibility Investigation*, prepared by Stevens, Ferrone & Bailey Engineering Company, Inc.[6]

Existing Environmental Setting

The term hazardous substance refers to both hazardous materials and hazardous wastes. A material is defined as hazardous if the material appears on a list of hazardous materials prepared by a federal, State or local regulatory agency or if the material has characteristics defined as hazardous by such an agency.

The California Environmental Protection Agency, Department of Toxic Substances Control (CAL-EPA, DTSC) defines hazardous waste, as found in the California Health and Safety Code Section 25141(b), as follows:

> […] its quantity, concentration, or physical, chemical, or infectious characteristics: (1) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; (2) pose a substantial present or potential hazard to human health or the environment, due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, or disposed of, or otherwise managed.

The project site primarily consists of vacant land. However, a natural gas well exists in the northeast portion of the site. In addition, near the western boundary is evidence of a former agricultural residence with associated buildings and an inactive water well. Historic land uses on the proposed project site include agricultural and natural gas production. Historic agricultural uses in the area could include the use of various herbicides and pesticides that were commonly used for pest control during crop production.

On-Site Hazards of Concern

This section describes the hazards of concern that exist within the proposed project site. Hazards of concern include gas wells, contaminated soils from storage containers, and leaking underground or aboveground tanks. These hazards may pose various threats to humans and resources should they come in contact with the materials or contaminated areas.

Gas Wells

Two portable small metal buildings and an adjacent aboveground pipe are located in the northeast portion of APN 016-170-013. A gas well head and pumping equipment were previously located on this parcel. One gas well head and associated pumping equipment still exist on APN 016-170-012. This gas well head is located within an easement area; the location is as shown on Figure 3-4, Vesting Tentative Subdivision Map, in Chapter 3 of this EIR. In the eastern portion of the project site, north of the proposed Sand Creek Road extension, a natural gas well exists (See Figure 4.6-1). According to the Department of Oil and Gas (DOG) records, the well was drilled in November 1996 and is currently producing natural gas.

Contaminated Soil

Soil contamination may come from various different sources such as agricultural sources (including pesticide use), irrigation, and oil and gas wells. Existing land uses of the proposed project area include agricultural uses and a natural gas producing structure, which may have contaminated soils.

Pesticide Contamination

Prior to development in the City of Brentwood, agricultural land cultivation was historically practiced and included apples, peaches, cherries, vineyards, tomatoes, corn, other vegetables, seeds, nuts, and livestock grazing. The project site was last used for agricultural production. Due to the agricultural nature of the region, the possibility exists that soils may have been previously contaminated with pesticides and fertilizers. Certain organochlorine pesticides, DDT for example, are extremely persistent in the environment and residual pesticide concentrations in surface soils are, consequently, a possible contaminant on former agricultural sites.

Water Well Contamination

An inactive water well exists on the western portion of the site. The water well is not anticipated for use and requires proper abandonment.

Underground Storage Tanks

Storage containers may cause hazards to the environment if they leak onto surrounding soil or if they are not removed and remediated in a proper manner. Historically, two underground storage tanks and two associated fuel dispensers were used near the former residence and associated farming structures.

It should be noted that although the biological resources evaluation for the project site notes the presence of an excavated pit along the east side of the property (approximately 15 feet wide and 80 feet long and used as a dump site by area residents in the past), the pit has since been covered and does not pose a hazard on-site.

Record Details

National Priorities List (NPL) – EPA's national listing of contaminated sites targeted for cleanup because they pose a threat to human health and the environment. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) authorizes and requires the EPA to investigate, categorize, and enforce the cleanup of hazardous waste sites on the NPL. An NPL site on, or near a particular property may threaten the environmental integrity of the property or affect its marketability.

Sites within a one-mile radius of the project site were not identified during the NPL database search.

CORRACTS – An EPA maintained database of Resource Conservation and Recovery Act (RCRA) facilities undergoing "corrective action." A "corrective action order" is issued when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

Sites within a one-mile radius of the project site were not identified during the CORRACTS database search.

CERCLIS and CERCLIS/NFRAP – Lists of sites that the EPA has investigated or is presently investigating for release or threatened release of hazardous substances, which may be subject to review in accordance with the terms and conditions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also known as Superfund). Sites listed on the "No Further Remedial Action Planned" (NFRAP) database are sites where, following an initial investigation, contamination was not found, contamination was removed quickly, or the contamination was not serious enough to require federal Superfund or NPL consideration.

Sites within a 0.5-mile radius of the project site were not identified during the CERCLIS/NFRAP database search.

Resource Conservation and Recovery Act (RCRA) Program – Identifies and tracks hazardous waste from the point of generation to the point of disposal. Information from the RCRA database is divided into three categories: TSD, LG GEN, and SM GEN. The TSD category is searched to a one-mile radius and tracks facilities that treat, store, and/or dispose of hazardous waste. LG GEN, or large generators, are facilities that generate more than 1000 kg of hazardous waste per month. SM GEN, or small generators, are facilities that generate between 100 and 1000 kg of hazardous waste per month. The LG GEN and SM GEN database are searched up to a one-eighth–mile radius from the project site.

Sites within a one-mile radius of the project site were not identified during the RCRA-TSD database search. Sites within a one-eighth-mile radius of the project site were not identified during the RCRA (LG-and SM-GEN) database search.

Federal Institutional Control (IC)/Engineering Control (EC) Registries – The registry consists of sites with institutional controls and engineering controls.

The project site was not identified in the Federal IC/EC database search.

Emergency Response Notification Systems (ERNS) List – The list is the EPA's database of emergency response actions.

The project site was not identified in the ERNS database search.

ENVIROSTOR – Envirostor is a database maintained by the DTSC Site Mitigation and Brownfields Reuse Program, which identifies sites that have known contamination or sites for which there may be reasons to investigate further.

Sites within a one-mile radius of the project site were not identified during the Envirostor database search.

SLIC sites – Sites that are provided by the RWQCB. The list includes sites that have recorded spills, leaks, and investigations, and cleanups.

Sites within a one-eighth-mile radius of the project site were not identified during the SLIC database search.

Solid Waste Landfills (SWLF) – A database generated by the State of California Solid Waste Information System, which includes active and inactive landfills and transfer stations within the state maintained by the California Integrated Waste Management Board.

One site within a 0.5-mile radius of the project site was identified during the SWLF database search. This site is the City's Solid Waste Transfer Station located north of Sunset Road, approximately 2,173 feet northeast of the project site. Based on the relative distance from the project site, and inferred directions of groundwater flow, the transfer station site is not anticipated to result in a significant environmental concern.

HAZNET Sites – A database which consists of data that is extracted from the copies of hazardous waste manifests received each year by the DTSC.

The project site was not identified during the HAZNET database search.

Underground/Aboveground Storage Tanks (UST/AST) List – A comprehensive list of registered underground and aboveground storage tanks located in the State of California.

One site within a 0.25-mile radius of the project site was identified during the UST/AST database search. The storage of hazardous materials within registered tanks is not considered a significant environmental concern.

Leaking Underground Storage Tanks (LUST) List – A list produced by the RWQCB of known sites with current or former leaking underground storage tanks on the premises.

Three sites within a 0.5-mile radius of the project site were identified during the LUST database search. The closest LUST site, the First Stop Auto Mart at 7935 Brentwood Boulevard, is located approximately 762 feet south of the project site. The other two LUST sites, both located approximately one-quarter mile from the project site, are identified as Saver's SS, located at 2323 State Route 4, and Beacon Station #544, located at 7920 Brentwood Boulevard. Based on the relative distance from the project site, direction of groundwater flow, and/or regulatory status, the LUST sites are not anticipated to represent a significant environmental concern.

State Deed Restriction (DEED) List – A list maintained by the DTSC Site Mitigation and Brownsfield Reuse Program and Hazardous Waste Management Program. The lists include cleaned, former, and current hazardous waste facilities.

The project site was not identified during the DEED database search.

Other

The site was not identified within a 0.5-mile radius of a State Voluntary Cleanup Program Site, Federal Land Use/Native American Lands of the U.S., or State/Tribal Brownfields databases searches.

The Marsh Creek #2 Dehydration Station, located near the northeastern boundary of the site, was identified in the Contra Costa County Site List. The Hazardous Materials Business Plan (HMBP) stated that, in 2002, eight pounds of methane, one steel drum of natural gas condensate, and one 2,000 gallon Above Ground Storage Tank of ethylene glycol were located on site.

Following a Phase 1 Environmental Site Assessment, eight soil samples were collected and analyses indicated that a release of petroleum hydrocarbons occurred on APN 016-170-013. On December 12, 2005, nine soil borings were drilled for soil and groundwater sample collection. The sample analyses identified impacted soil and groundwater. On December 17, 2005, an additional ten borings were drilled to further assess the extent of impacted groundwater. Eleven trenches were excavated outward on May 21 and 30, 2007 to depths of 10 and 12 feet and soil samples were collected. The findings were used to generate an Interim Removal Action Plan proposing limited soil excavation to the Regional Water Quality Control Board.

During the fourth quarter of 2007 through April 2008, approximately 18,700 cubic yards of petroleum hydrocarbon contaminated soils were excavated at the project site. On September 19, 2008, six additional soil borings were taken at the site. The borings were evenly spaced from approximately 70 feet to 130 feet outside the perimeter of the excavation, beginning on the southeastern portion of the excavation and moving counterclockwise to the north of the

excavation. Groundwater and select soil samples indicated that petroleum hydrocarbons were not present at or above the laboratory detection limit with the exception of groundwater SB-35 where TPHd and TPHmo were detected at relatively low concentrations.

AEI Consultants is currently working with the RWQCB to satisfy requirements for residential clean-up standards in order to obtain case closure at the site.

Regulatory Context

Many agencies regulate hazardous substances. The following discussion contains a summary review of regulatory controls pertaining to hazardous substances, including federal, State, and local laws and ordinances.

Federal Regulations

Federal agencies that regulate hazardous materials include the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the Department of Transportation (DOT), and the National Institute of Health (NIH). The following federal laws and guidelines govern hazardous materials:

- Federal Water Pollution Control Act;
- Clean Air Act;
- Occupational Safety and Health Act;
- Federal Insecticide, Fungicide, and Rodenticide Act;
- Comprehensive Environmental Response, Compensation, and Liability Act;
- Guidelines for Carcinogens and Biohazards;
- Superfund Amendments and Reauthorization Act Title III;
- Resource Conservation and Recovery Act;
- Safe Drinking Water Act; and
- Toxic Substances Control Act.

Prior to August 1992, the principal agency at the federal level regulating the generation, transport and disposal of hazardous waste was the EPA under the authority of the Resource Conservation and Recovery Act (RCRA). As of August 1, 1992, however, the California Department of Toxic Substance Control (DTSC) was authorized to implement the State's hazardous waste management program for the EPA. The federal EPA continues to regulate hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

State Regulations

The California Environmental Protection Agency (Cal-EPA) and the State Water Resources Control Board establish rules governing the use of hazardous materials and the management of hazardous waste. Applicable State laws include the following:

- Public Safety/Fire Regulations/Building Codes;

- Hazardous Waste Control Law;
- Hazardous Substances Information and Training Act;
- Air Toxics Hot Spots and Emissions Inventory Law;
- Underground Storage of Hazardous Substances Act; and
- Porter-Cologne Water Quality Control Act.

Within Cal-EPA, DTSC has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the State agency, for the management of hazardous materials and the generation, transport, and disposal of hazardous waste under the authority of the Hazardous Waste Control Law (HWCL).

Assembly Bill 387 and Senate Bill 162

On January 1, 2000, two laws affecting schools became effective: Assembly Bill (AB) 387 and Senate Bill (SB) 162. These bills require that the DTSC be involved in the environmental review process for the proposed acquisition and/or construction of school properties utilizing state funding. Assembly Bill 387 and SB 162 address concerns raised by parents, teachers, local communities, and the Legislature over school site properties that are or may be contaminated by hazardous materials and may pose a health threat to children and school faculty. The Department of Toxic Substance Control's (DTSC) role in the assessment, investigation, and cleanup of proposed school sites is to ensure that selected properties are free of contamination, or if the property is contaminated, that the site is cleaned up to a level that is protective of the students and faculty that will occupy the new school.

In conjunction, AB 387 and SB 162 provide a comprehensive program to ensure that hazardous material contamination issues are adequately addressed prior to school development. The program involves the preparation of a Phase I Environmental Site Assessment to determine whether a release of a hazardous material has occurred onsite in the past or if there may be a naturally occurring hazardous material present at the site. Based on the information gathered, the Phase I should conclude that either 1) recognized environmental conditions were not identified, or 2) a Preliminary Endangerment Assessment (PEA) is necessary.

Local Regulations

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

Safety Element

Goal 1 Protect from hazards - Protect the Brentwood community from hazards associated with the natural environment.

Policy 1.1 Minimize Risks – Minimize risks of personal injury and property damage associated with natural hazards.

Policy 1.2 Land Movement - Protect life and property from potential landslides and earthquake hazards within the Planning Area.

Policy 1.5 Fire Hazards - Minimize fire hazards within the Planning Area.

Goal 2 Hazardous Materials - Maintain Brentwood safe from risks associated with hazardous materials.

Policy 2.1 Hazardous Materials - Protect the community of Brentwood from hazards associated with the use, transport, treatment, and disposal of hazardous substances.

Goal 3 Emergency Services - Protect the safety of life and property throughout the Brentwood community by providing high quality emergency services.

Policy 3.1 Efficient Service – Provide for effective and cost efficient fire and emergency medical service to the City to minimize potential injury, loss or destruction to persons or property.

Impacts and Mitigation Measures

Standards of Significance

In accordance with CEQA, the effects of a project are evaluated to determine if they would result in a significant adverse impact on the environment. For the purposes of this EIR, an impact is considered significant if the proposed project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Method of Analysis

Site conditions and impacts for this chapter are based on the City of Brentwood General Plan, the City of Brentwood General Plan EIR, the Phase I Environmental Site Assessment (ESA), and

State, local, and federal database searches including the following: California Department of Toxic Substance Control; the California Environmental Protection Agency's Cortese List; California Regional Water Quality GeoTracker database; the United States Environmental Protection Agency; the California Department of Conservation's Division of Oil, Gas, and Geothermal Resources; and the Superfund Information System, CERCLIS Database.

Project-Specific Impacts and Mitigation Measures

4.8-1 Impacts related to exposure to manmade asbestos and lead-based paint.

Asbestos was a material commonly used in heating and electrical insulation because of the material's resistance to fire and heat. However, later discoveries found that, when inhaled, the material caused serious illness and was banned from use in the early 1970s. Materials that may contain asbestos can include, but are not limited to, resilient floor coverings, drywall joint compounds, acoustic ceiling tiles, piping insulation, electrical insulation, and fireproofing materials.

In addition to asbestos, lead-based paints could be present in older structures. Typically, exposure to lead from older vintage paint is possible when the paint is in poor condition or is being removed. In construction settings, workers could be exposed to airborne lead during renovation, maintenance, or demolition work. Lead-based paints were phased out of production in the early 1970s.

Implementation of the proposed project would not include the demolishing or removal any existing structures. Therefore, because structures containing asbestos or lead paint would not be disturbed, a ***less-than-significant*** impact would result.

<u>Mitigation Measure(s)</u>
None required.

4.8-2 Impacts related to the presence of gas wells.

The ESA prepared for the project site by AEI Consultants shows that a natural gas well exists in the eastern portion of the site, on APN 016-170-012. The applicant has indicated that removal of the gas well is not part of the project. The well would, however, be removed prior to any development at the well site. Removal of the well would require a well abandonment permit from the Contra Costa County Environmental Health Department, as well as approval by the Division of Oil, Gas, and Geothermal Resources (DOGGR), and a licensed contractor would be required to perform the work.

However, the well may be retained and integrated into future development, which would require special site planning considerations. As stated above in the Existing Environmental Setting section, a contaminated portion of the site (APN 016-170-013) has been excavated and AEI Consultants is working with the RWQCB to determine if additional tasks are necessary.

In addition, Chapter 17.680 of the Brentwood Municipal Code regulates the production of oil and gas, including situations where development is proposed in areas that contain existing production facilities. Given the location of an existing gas well in the northeast portion of the site, future development in the vicinity of that area will be required to comply with the provisions of said chapter. Therefore, because contaminated soils could be present on the project site and because the project would include future development adjacent to an existing gas well, a ***potentially significant*** impact would occur.

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

4.8-2(a) *Prior to the issuance of grading permits for Sub-Area 5A, the applicant shall provide a "No Further Action Required" letter from the RWQCB for review by the Contra Costa County Environmental Health Department and the Brentwood Community Development Director and Public Works Department.*

4.8-2(b) *Prior to the approval of any development within Subareas 3A, 3B, 4, or 5A, the applicant shall demonstrate compliance with Chapter 17.680 of the Brentwood Municipal Code (Oil and Gas Production), to the satisfaction of the Community Development Director.*

4.8-3 Impacts related to the presence of pesticide and/or herbicide residues on the project site.

Buildout of the proposed project may include the construction of up to approximately 608 dwelling units at various densities, commercial and office uses, and neighborhood parks. The proposed project area is located within the eastern portion of the City. Because of the past and current agricultural uses, the proposed project site could contain materials that may be considered hazardous, such as residual pesticides and herbicides that are often associated with agricultural uses. An Agricultural Chemical Survey and Agricultural Chemical Survey Addendum dated January 9 and January 27, 2006, respectively, prepared by AEI Consultants states that on November 7 and 8, 2005, AEI Consultants performed shallow soil sampling activities for the proposed project site. The soil sample results indicate that dicholorodiphenyldicholoroethylene (DDE) and dicholorodiphenyltricholorethane (DDT) pesticides were present in a majority of the samples. However, DDE and DDT concentrations were reported at concentrations ranging from 0.015 milligrams per kilograms (mg/kg) to 0.14 mg/kg and 0.0022 mg/kg to 0.043 mg/kg, respectively. These concentrations are well below the respective Environmental Screening Level (ESL) of 1.6 mg/kg for DDE and DDT. In addition, a-chlordane and g-chlordane were detected at concentrations well below the ESL level.

Lead and arsenic samples were also collected. Soil samples determined lead was present at concentrations ranging from 18 mg/kg to 110 mg/kg, below the ESL for lead of 150 mg/kg, and does not appear to pose a risk to human health or the environment. However,

arsenic was found at concentrations ranging from 13mg/kg to 19 mg/kg, above the ESL for arsenic of 5.5 mg/kg. On request by the Contra Costa County Hazardous Materials Programs (CCCHMP), eight additional soil samples, in addition to the original 11 samples were reanalyzed for arsenic. Arsenic was detected from samples nine to 12 inches below ground surface at concentrations ranging from 11 mg/kg to 20 mg/kg, with an average of 15.9 mg/kg. Concentrations of arsenic were also detected in samples 21 to 24 inches below ground surface ay 8.0 mg/kg to 14 mg/kg, with an average of 10.2 mg/kg. Based on the universal presence of arsenic in the soil samples, AEI Consultants concluded that arsenic is a naturally occurring element in the soil at the project site, and remediation of arsenic is not warranted. In addition, naturally occurring asbestos has been documented through the regional area at concentrations up to 20 mg/kg.

Based on the very low concentrations of several pesticides detected, the residual pesticides are not anticipated to pose a threat to human health or the environment. The concentrations of lead and arsenic were indicative of naturally occurring concentrations. The soil sampling results were presented to the CCCHMP for review and concurrence that further action is not required. The CCCHMP agreed that historical pesticide use on the site does not pose a threat to human health or the environment and further action is not required. Therefore, a ***less-than-significant*** impact from pesticides, lead, and arsenic would occur.

Mitigation Measure(s)
None required.

4.8-4 Impacts related to soil contamination from the presence of underground storage tanks and agricultural irrigation wells.

Soil contamination may come from various sources such as underground storage tanks, substance containers, and irrigation water pumps associated with agricultural irrigation wells. Soil contamination may cause hazards to the environment if contaminants leak onto surrounding soil or if contaminants are not removed and remediated in a proper manner.

Underground Storage Tanks (USTs)

According to the interviews conducted for the ESA, two underground storage tanks and pumping stations existed on site. AEI Consultants conducted a magnetometer scan to identify potential locations for USTs. Subsequent soil borings and groundwater samples determined that a significant release of contamination from leaking USTs has not occurred. However, the Phase I was unable to confirm the presence, and the USTs may still remain in place.

Agricultural Irrigation Well and Water Well

The project site was historically used for agricultural productions and an inactive irrigation well and water well remain on site. Well equipment, if not maintained, may

leak oil, gas, and/or lubricants onto the surrounding soil, causing contamination of the soil and potentially the water. The ESA determined that contamination did not exist; however, the wells should be properly abandoned and destroyed.

Septic System

Historically, the former residence utilized a septic system with one septic tank that is not currently in use. The location of the tanks is not known and records of removal of the tank do not exist. The ESA determined that the septic system should be properly abandoned/decommissioned.

Conclusion

The ESA was unable to determine the location and the condition of the USTs. The ESA determined that if encountered, USTs and septic systems should be properly destroyed or removed. The introduction of people to the site as a result of the proposed project, combined with the potential hazards associated with USTs, agricultural wells, and septic systems on the site would be considered a ***potentially significant*** impact.

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

4.8-4(a) *During grading and construction activities, if Underground Storage Tanks are encountered, the applicant shall hire a licensed contractor to remove the USTs. In addition, the applicant shall obtain a permit from Contra Costa County Environmental Health Department, and properly remove the UST, per review and approval of the Contra Costa County Environmental Health Department. If soils suspected of being contaminated are encountered, they shall be removed in accordance with RWQCB guidelines. Further remediation, if necessary, and disposal of the soils shall be conducted in accordance with State and federal guidelines.*

4.8-4(b) *During grading and construction activities, if septic systems are encountered, the applicant shall hire a licensed contractor to remove the septic systems. In addition, the applicant shall obtain a permit from Contra Costa County Environmental Health Department, and properly abandon/decommission the septic system, per review and approval of the Contra Costa County Environmental Health Department. If soils suspected of being contaminated are encountered, they shall be stockpiled on plastic sheeting. Stockpiled soils shall be sampled in accordance with RWQCB guidelines, and the findings forwarded to the RWQCB for review. Further remediation, if necessary, and disposal of the soils shall be conducted in accordance with State and federal guidelines.*

4.8-4(c) *Prior to initiation of any ground disturbance activities within 50 feet of a well, the applicant shall hire a licensed well contractor to obtain a well abandonment permit from Contra Costa County Environmental Health Department, and properly abandon the on-site wells, per review and approval of the Contra Costa County Environmental Health Department.*

4.8-5 Impacts related to coccidioidomycosis.

Construction of the homes and other buildings associated with the proposed project would include excavation and grading on soils that could potentially contain arthroconidia, or the spores of the fungus that causes coccidioidomycosis or "Valley Fever." The disturbance of soils through excavation and grading activities could lead to spores being released into the air and potentially infecting persons on or near construction site(s). As discussed in the above section regarding "On-site Hazards of Concern," eight cases of coccidioidomycosis were reported in the City of Brentwood during the period of 2003 to 2007. Because construction of the proposed project could result in the dispersion of the fungus that causes coccidioidomycosis, the project would be considered to have a ***potentially significant*** impact.

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

4.8-5(a) *Prior to construction, the project applicant shall initiate a training and education program for construction workers on-site, as indicated in the Report on Control of Coccidioides immitis (Valley Fever), which was issued in August 1995 by the Kern County Department of Public Health's Valley Fever Task Force. The program shall be reviewed and approved by the Community Development Director.*

4.8-5(b) *During construction, the project contractor shall comply with all dust control measures and procedures issued by the Bay Area Air Quality Management District (BAAQMD) in order to decrease exposure to arthrospores present in soil and dust. In addition, all applicable local and State regulations shall be complied with including, but not limited to, the California Labor Code and Title 8 of the California Code of Regulations, Section 3203, which addresses respiratory protection and general industry safety orders, and requires employers to have Injury and Illness Prevention Plans.*

4.8-6 Impacts related to wildland fires.

Wildland fire hazards threaten lives, property, and natural resources throughout the City. Wildfire is a serious hazard in undeveloped areas and on large lots with extensive areas of unirrigated vegetation. Natural vegetation and dry-farmed grain areas are extremely flammable during the late summer and fall. According to the City of Brentwood General

Plan, the greatest fire concern is the urban/wildland interface, where the edges of development meet rural areas. Although vacant and agricultural fields exist adjacent to the eastern boundary of the proposed site, the field is not vast enough to pose a threat from wildland fires and is proposed for residential development.

Furthermore, mitigation included in Chapter 4.9, Public Services, requires applicants to demonstrate adequate provision of water for fire fighting purposes, to provide adequate access before building with flammable materials, and to demonstrate compliance with all applicable requirements of the Fire District. Therefore, wildland fires would represent a ***less-than-significant*** impact on the proposed project.

Mitigation Measure(s)
None required.

4.8-7 Impacts related to ground shaking.

According to the Brentwood General Plan Update, a number of faults in and adjacent to the City of Brentwood are capable of producing ground shaking in Brentwood. Ground shaking is complex and the intensity depends on a number of interrelated variables, including earthquake magnitude, distance from the epicenter, focal depth, fault geometry, site geology, and topography. Damage related to ground shaking is usually greatest in areas underlain by compressible, water-saturated, and fine-grained alluvium. Damage is typically less severe in areas underlain by hard, dry bedrock.

Based on the ground shaking intensity maps for the City of Brentwood and historic seismic events, the maximum anticipated earthquake intensity that may be felt in the Brentwood Planning Area due to an event on active regional faults is approximately a V to VIII on the Modified Mercalli Scale, which is commonly used by seismologists to rate the intensity of an earthquake's effects. The intensity of shaking would be greatest for areas underlain by alluvium, such as the eastern portion of the Brentwood Planning Area, and shaking would tend to be less severe in the hills along the western portion of the Brentwood Planning Area. Typical effects of ground shaking at intensities of V to VIII include movement of heavy furniture, cracked or fallen plaster, damaged chimneys, and twisting and fall of monuments and towers. Structural damage to well built structures is typically minimal; however, structural damage to older, poorly built structures can be significant.

Site development and design are regulated in the State of California by the California Building Standards Commission (CBSC), through the California Building Code (CBC), and are suited to the unique sensitivity of the State's geology and faultlines. The CBSC and CBC regulations must be complied with in consideration of expansive soils, drainage, erosion, earthquake resistance, and required safety measures during on-site development. Because the project area may be subject to episodes of ground shaking, very loose to loose sands and silts may experience settlement due to seismic compaction (i.e., liquefaction). The potential for structures to be damaged by ground rupture or ground shaking is considered to be relatively unlikely; however, all structures should be

designed using sound engineering judgment and the latest CBC requirements, as a minimum.

Buildout of the proposed project would include construction-related activities and the eventual development of structures that could be subject to seismic activities. This would result in a ***potentially significant*** impact related to ground shaking.

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

4.8-7 *Prior to issuance of a grading permit, the project applicant shall submit and comply with the recommendations in site-specific Geology and Soils Assessment, at the discretion of the City Engineer. The assessment shall be reviewed and approved by the City Engineer or his/her designee. The Geology and Soils Assessment must include, but not be limited to, an assessment of impacts related to ground shaking and include mitigation to minimize harm to structures and humans, including compliance with the latest CBC regulations relating to ground shaking.*

4.8-8 Impacts related to operational hazard-related residential, office, and institutional uses.

The residential, office, light industrial, and institutional uses of the project would not entail the routine transport or disposal of hazardous materials. In addition, prior to occupancy, the on-site gas well would be abandoned pursuant to Contra Costa County Environmental Health Department standards and polices. A small number of retail uses could require the transportation or disposal of potentially hazardous materials. However, the project would be required to comply with local, State, and federal safety standards for transporting hazardous materials. Therefore, impacts are reduced to a ***less-than-significant*** level.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

4.8-9 Long-term hazards-related impacts from the proposed project in combination with existing and future developments in the Brentwood area.

Impacts associated with hazardous materials are site-specific and generally do not affect nor are affected by cumulative development. Surrounding land uses are mostly residential, which typically does not include the routine transport, use, or disposal of hazardous materials. However, the proposed project is located along Brentwood Boulevard (State Route 4), which is a major thoroughfare throughout the region, and the possibility exists that the area from Delta Road to Second Street would be used for

routine transport of hazardous materials. However, that transport would be subject to federal, State, and local hazardous materials management requirements, and would be expected to be diverted to the State Route 4 Bypass at the time all three segments are complete (by the end of 2009), which would minimize potential risks associated with increased hazardous materials use in the community. Therefore, implementation of the proposed project would have a ***less-than-significant*** impact associated with cumulative hazardous materials use.

Mitigation Measure(s)
None required.

Endnotes

[1] City of Brentwood. *General Plan Update.* Amended through January 2006.
[2] City of Brentwood. *General Plan Update EIR*. June 25, 2001.
[3] Personal communication with Contra Costa County Health Services, Hazardous Materials Program, A. McMullen, Senior Clerk. September 19, 2007.
[4] AEI Consultants. *Phase I Environmental Site Assessment Brentwood Boulevard and Sand Creek Road*. September 20, 2007.
[5] AEI Consultants. *Summary Letter – Portion of Sciortino Property*. October 6, 2008.
[6] Stevens, Ferrone & Bailey Engineering Company, Inc. *Geotechnical Feasibility Investigation Sciortino Property Residential Development*. December 1, 2005.

4.9 PUBLIC SERVICES AND UTILITIES

4.9 PUBLIC SERVICES AND UTILITIES

Introduction

The Public Services and Utilities chapter summarizes setting information and identifies potential new demands resulting from the proposed Sciortino Ranch Project on water supply, wastewater systems, storm drainage, solid waste disposal, law enforcement, fire protection, schools, libraries, gas and electric facilities, and parks and recreation. Information for this section was primarily drawn from project information provided by the City of Brentwood *2005 Urban Water Management Plan*,[1] the *East Contra Costa County Water and Wastewater Municipal Service Review for the City of Brentwood*,[2] the *City of Brentwood Water Master Plan*,[3] the *City of Brentwood General Plan Update*,[4] and the City of Brentwood General Plan Update EIR.[5]

Environmental Setting

This setting section describes the existing services and utilities serving the project site, including the water system, wastewater collection and treatment, storm drainage, law enforcement, fire protection, schools, solid waste collection and disposal, parks and recreation facilities, and other related public utilities.

Project Description

The Sciortino Ranch Project (proposed project) consists of approximately 65 acres located along Brentwood Boulevard within the City of Brentwood. The proposed project includes approximately 228,690 square feet of institutional uses, 87,911 square feet of office, 107,267 square feet of retail uses, up to 608 residential dwelling units of various densities, and 5.1 acres of park. (See Table 3-1 of the Project Description Chapter of this Draft EIR, Land Use Assumptions for Analysis). In addition, the project would divide the project site into eleven sub-areas. See Table 4.1-2 in this Draft EIR, Sciortino Ranch Zoning Matrix for PD-55, for a detailed breakdown of the potential mix of land uses in each sub-area.

Water System

<u>City of Brentwood Urban Water Management Plan</u>

The 2005 Brentwood Urban Water Management Plan (UWMP) addresses the City of Brentwood Water System for the purpose of ensuring efficient use and to promote the conservation of urban water supplies in the City of Brentwood.[6] The Brentwood Water System currently serves about 16,000 connections. The service area is bounded by Sellers Avenue to the east, Briones Valley Road, Concord Avenue, Creek Road and the East Contra Costa Irrigation District (ECCID) Main Canal to the south, Heidorn Ranch Road to the west, and Lone Tree Way (Antioch), Neroly Road (Oakley) and Delta Road (Knightsen) to the north. The service area is primarily residential,

with small areas of commercial, office, and light industrial land use. The City land use plan has numerous parks, large areas of agriculture conservation, and special planning areas that are undeveloped.

The UWMP fulfills several purposes: 1) the UWMP is the year 2005 Urban Water Management Plan as required by the Urban Water Management Planning Act (1983-4); 2) the UWMP provides the analysis of water conservation measures in accordance with the guidelines of the California Urban Water Conservation Council; and 3) the UWMP serves as the long-term water supply plan for the City of Brentwood Water System. The UWMP projects the long-term water supply and demand for the City of Brentwood in five-year increments from 2005 to 2025.

City of Brentwood's Existing Water Supply

The City of Brentwood's water sources include locally produced groundwater, surface water from the San Joaquin River Delta through ECCID, and recycled water.

Groundwater Supply

According to data provided in the Contra Costa County LAFCO Municipal Service Review (MSR) for the City of Brentwood, the City obtains approximately half of its water supply from groundwater extracted from the San Joaquin Basin, which is not adjudicated. The City has eight wells producing at a rate of approximately 4,200 gallons per minute or 6.0 million gallons per day. The groundwater quality is adequate, but does have detectable levels of total dissolved solids, chlorides, and nitrates. These dissolved solids fall within required limits, though they are on the higher end of the acceptable range. Treatment is provided at the wellheads and the water is pumped directly to the distribution system. One of the wells is unusable several months a year due to poor water quality, and the City is evaluating the installation of a mechanical treatment process to improve the reliability of this source.

Because the San Joaquin Basin is not adjudicated, legal limits on groundwater production are not applicable. In 1999 the City, in conjunction with the East County Water Management Association, conducted a groundwater study to evaluate the current status of the groundwater resources, among other things. Although the determination of basin capacity was not included as a part of the scope of work, the determination was made that the basin was able to sustain the current (as of 1999) production of the City and other groundwater users and that no overdrafting of the basin had occurred. The City's two main well fields are located in the northeast part of town and to the southeast. According to the City's 2005 Urban Water Management Plan, "Static water level readings from the City's wells indicate that the water level difference may be 20 to 200 feet and is most likely caused by municipal pumping, as well as hydrogeological differences found throughout the City. The City's pumping, however, has not affected the larger regional system." The City is monitoring water levels and water quality to determine whether the deeper zones of the newer municipal wells might cause degradation of water quality by inducing downward movement of water quality constituents. This water source is considered reliable at this point to meet a portion of the demands as projected in the City's adopted 2005 Urban Water Management Plan.

Surface Water Supply

The balance of Brentwood's water supply is obtained from the San Joaquin River Delta through an agreement with the East Contra Costa Irrigation District (ECCID). In 1999, Brentwood and ECCID entered into an agreement that provides the City with a permanent entitlement to purchase 14,800 acre-feet per year (AF/Yr) of irrigation water from the Delta. ECCID owns the pre-1914 water rights, which are not subject to delivery reductions during water shortages including regulatory restricted and drought years. The water purchased by Brentwood may only be used by the City and its retail customers within the City boundary or ECCID boundary.

If necessary, Brentwood also has the option to purchase treated water from CCWD through a 2004 agreement wherein Brentwood purchased a treatment capacity right at the Randall-Bold Water Treatment Plant, entitling the City to up to six million gallons per day (mgd) or 3,200 AF/Yr of treated water for use within the area that overlaps between the City and CCWD. The source of this treated water is Brentwood's ECCID water. The City is entitled to the water quality and emergency storage benefits within CCWD's raw water system for the connections within the overlap area.

CCWD has water rights for filling Los Vaqueros Reservoir. The Los Vaqueros water rights are for water quality and emergency storage purposes and do not result in new supply.

Water Demand

In 2006, residential uses accounted for 87 percent of water demands and commercial/institutional accounted for 13 percent. The proportional share between residential and commercial service is expected to remain relatively consistent through 2025. For master planning purposes, the City estimates future water demand based on land use, ranging from 410 gallons per day (gpd) per unit for medium density residential to 1,000 gpd/unit for ranchette estates. For planning purposes, the system-wide maximum day demand at buildout is 41 mgd. The City's 2005 Urban Water Management Plan indicates that water demands are expected to increase by 225 percent by 2025, with water use factors of 181 gpd/person in 2003 increasing to 309 gpd/person in 2030. (Conservation measures taken in the future are not reflected in the projected water demands.) The 2005 Urban Water Management Plan uses a demand projection in 2025 of 21,419 AF/Yr or 19.1 mgd average day demand and 39.9 mgd for maximum day demand. The 2006 Water Master Plan is based on demand projections of 41 mgd maximum day demand at build-out with a maximum day supply of 42 mgd (30 mgd from the Brentwood Water Treatment Plant (BWTP), six mgd from the Randall-Bold Water Treatment Plant (RBWTP), and six mgd from the City's groundwater wells).

Per the City of Brentwood's adopted 2005 Urban Water Management Plan, the City should have adequate water supply to meet normal, single and multiple dry years through 2025 based on available supplies. This includes the expansion of the Brentwood Water Treatment Plant, which was completed and put in service in late 2008. The City's water supply projections assume that the Brentwood Water Treatment Plant will be operational with a capacity of 13,443 AF/Yr (approximately 12 mgd). The projected water supply and demand for the City of Brentwood from 2005 to 2025 is included in Table 4.9-1. It is important to note that the surface water supply

to the City is a pre-1914 water-right purchased from ECCID that is not subject to water shortages during drought years. In addition, according to the Brentwood UWMP, groundwater is assumed to be unaffected by drought conditions. As evidenced in Table 4.9-1, no reductions from normal year supply are expected in single or multiple dry years.

Table 4.9-1
City of Brentwood Projected Water Supply and Demand (Normal Year)
(AF/Yr)

	2005	2010	2015	2020	2025
Normal Conditions					
Supply:					
Groundwater	5,350	7,662	7,662	7,662	7,662
Surface Water	6,720	20,162	20,162	20,162	20,162
Recycled	323	2,230	2,646	3,142	3,733
Total Supply	12,393	30,054	30,470	30,966	31,557
Demand	8,045	11,334	12,510	13,610	14,724
Difference	4,348	18,710	17,960	17,356	16,833
Single Dry Year Conditions					
Supply	NA	30,054	30,470	30,966	31,557
Demand	NA	11,334	12,510	13,610	14,724
Difference	NA	18,710	17,960	17,356	16,833
Multiple Dry Year Conditions					
Supply	NA	30,054	30,470	30,966	31,557
Demand	NA	11,344	12,510	13,610	14,724
Difference	NA	18,710	17,960	17,356	16,833

Source: City of Brentwood Urban Water Management Plan 2005.

Transmission Needs of the City's Water Supply System

The City's water distribution system consists of three primary pressure zones. Water pressure is maintained between 40 and 100 pounds per square inch gauge (psig). The Pressure Zone 1 distribution system serves all developments less than an elevation of 110 feet. Pressure Zone 2 is confined to areas with elevations greater than 110 feet and less than or equal to 220 feet. Pressure Zone 3 is limited to areas with elevations greater than 220 feet and less than or equal to 330 feet. It should be noted that the proposed project is located within Zone 1.

Storage

The six reservoirs in the City have a combined capacity of 18.7 million gallons (mg). The reservoirs are situated above-grade and are constructed of welded-steel or post tensioned concrete. These reservoirs provide equalization, emergency supply, and fire supply. A new 4.0-million gallon (mg) reservoir has been completed and is in service in Zone 2.

Using a total City maximum daily water demand of 41 mgd, the Brentwood 2006 Water Master Plan identifies the buildout water storage requirements for the City. According to Table 4.9-2, the total storage requirement, at the buildout of the City's three zones, is 33.0 million gallons. In order to provide for this storage, the Water Master Plan determined the total number and size of storage reservoirs (See Table 4.9-3).

Table 4.9-2
City Buildout Storage Requirements

Zone	Maximum Day Demand (mgd)	Maximum Fire Flow Requirement (gpm)	Required Buildout Storage Volume (MG)		
			Operational and Emergency (at 75 percent of day demand)	Fire Reserve	Total Storage Needed
1	25.5	4,000	19.1	0.96	20.1
2 (includes 3 North and 3 South)	13.5	4,000	10.1	0.96	11.1
3 Central	2.0	2,000	1.5	0.36	1.9
Total	**41.0**		**30.8**	**2.3**	**33.0**

Source: City of Brentwood Water Master Plan, 2006.

Pumping Facilities

Table 4.9-4 summarizes key features of the existing and future pumping facilities for buildout of the City system, and identifies whether pump stations are booster stations or hydropneumatic (containing both water and air under pressure) stations. In addition, Table 4.9-4 shows the low and high range for the discharge hydraulic grade lines (HGL) on the maximum day, at buildout. The discharge HGL will vary according to the hourly demand and reservoir re-filling conditions.

As discussed in the planning criteria, booster pump stations are sized for the maximum day demand (average flow on the maximum day) for the area they are intended to serve. Hydropneumatic stations must provide domestic pump capacity to meet domestic peak hour flows, plus a standby pump and a large fire pump and standby fire pump. Hydropneumatic stations also require backup power to ensure that pumps will be operational. The large fire pump and domestic pumps should be selected to provide the required flows under the same head conditions, i.e., that all pumps can operate together to provide the maximum day demand plus fire flow. Booster pump stations that pump into zones with reservoir storage do not need fire pumps or backup power.

Table 4.9-3
Existing and Future Storage Reservoirs

Zone	Reservoir Name	Location	Current Status	Type	Reservoir Elevation (ft)		Volume (MG)	
					Bottom	Overflow	Existing	Future
1	Res 1.1	South of San Jose Avenue and West of SR 4 Bypass	Existing	Gravity	197	229	2.5	
	Res 1.2		Existing	Gravity	197	229	4.3	
	Res 1.3	Off San Jose Avenue near Res 1.1 and 1.2	Existing	Gravity	197	229	4.0	
	Res 1.4	East side of Zone 1	Future	Pumped	60	9.2		5.0
	Res 1.5	East side of Zone 1	Future	Pumped	60	92		5.5
Subtotal – Zone 1							**10.8**	**10.5**
2	Res 2.1	Mountain View Dr. South of Balfour Rd	Existing	Gravity	320	348	2.0	
	Res 2.2		Existing Gravity	320	348	2.0	2.0	
	Res 2.3	Vineyards	Under Construction	Gravity	320	348	4.0	
	Res 2.4	Future West side site, West of Mountain View Dr.	Future	Gravity	320	348		3.0
Subtotal – Zone 2							**8.0**	**3.0**
3	Res 3.1	Future Site in Southwest off Mountain View Drive	Future	Gravity	430	460		2.0
Breakdown of Existing and Future Storage Volumes							**18.8**	**15.5**
Total Ultimate Systemwide Storage Volume							**34.3**	

Source: City of Brentwood Water Master Plan, 2006.

Pump Station (PS) 1.1, a treated water pump station, was completed at the new surface water treatment plant located north of Brentwood. This pump station pumps all treated surface water for the City into Zone 1, where the water passes through, as needed, to other zones. The first stage of the pump station construction consisted of two six mgd pumps and one 15 mgd pump. Ultimately, the pump station will have a firm capacity of 36 mgd.

As the new treated water pump station is on-line, the existing interim pump station, located at Empire Avenue and the Union Pacific Railroad, is not needed for normal treated water supply. The City has emergency intertie capabilities with Diablo Water District at this location, but the pumping facilities will be removed.

Table 4.9-4
Existing and Future Pump Stations

							Existing Facilities		Buildout Pumping Requirements	
Zone Pumping Into	**Pump Station Name**	**Location**	**Status**	**Type**	**Purpose**	**Modeled Ground Elevation (ft.)**	**Pumps**	**Firm Capacity**	**Firm Capacity**	**Modeled Discharge HGL Range (ft.)**
1	Interim	Empire Ave and UPRR	Existing - temporary	Booster	Will be abandoned when PS 1.1 is in service.	95	2 at 2,100 gpm each	3 mgd	To be abandoned in future	N/A
	PS 1.1	New WTP	Existing	Booster	Supply treated surface water from new WTP.	85	None	None	36 mgd	204-303
	PS 1.2	At future Res 1.4 and 1.5 site	Future	Booster	Pump water out of ground-level tanks on east side of Zone 1.	60	None	None	8.6 mgd	186-230
2	PS 2.1	South of Balfour Road in Brentwood Country Club	Existing	Booster	Existing Zone 2 pumping capacity to re-fill existing Zone 2 reservoirs and pass water through to Zone 3.	105	2 at 2,500 gpm each	3.6 mgd	9.3 mgd (expand existing pump station to add 1 at 1,500 gpm plus 1 standby at 2,500 gpm)	342-373
	HPS 2.2	Heidorn Ranch Rd near Lone Tree Way	Existing	Hydropneumatic now – convert to booster	Serves isolated northwest part of Zone 2. Will be converted to booster station when area is connected with rest of Zone 2.	140	2 at 700 gpm each; 1 at 3,000 gpm	2.0 mgd without fire pump	Replace pumps to provide 2.3 mgd (1,600 gpm) total firm capacity plus standby pump to operate as booster station at TDH of 124 feet	342-373
	PS 2.3	Vineyards at Fairview Ave	Existing	Booster	Additional Zone 2 pumping capacity and re-fill Res 2.3.	137	None	None	3.9 mgd (1 at 1,700 gpm, 2 at 500 gpm, plus 1 standby at 1,700 gpm)	343-365
3	HPS 3.1	Near Res 1.1 and 1.2 (Brentwood Hills)	Existing	Hydropneumatic	Existing hydropneumatic station serving Zone 3 North.	220	1 at 400 gpm and 1 at 3,000 gpm	Station has adequate capacity for demand-no standby pumps	Could consider adding standby pump	358-405
	HPS 3.2	Near Res 2.1 and 2.2 off Mountain View Road	Existing	Hydropneumatic	Existing hydropneumatic station serving Zone 3 Central that will be converted to booster station when Res 3.1 is constructed.	320	2 at 640 gpm each and 1 at 3,000 gpm	1.84 mgd without fire pump	2.0 mgd when converted to PS 3.2 Booster Station (2 at 700 gpm, plus a 700 gpm standby pump)	452-461
	HPS 3.3	Vineyards	Existing	Hydropneumatic	Future hydropneumatic station serving Zone 3 South.	296	None	None	4.0 mgd total (1 at 200 gpm, 1 at 550 gpm, 1 at 2,000 gpm, plus 550 gpm standby pump.)	400-426

The only other pump station in Zone 1 will be PS 1.2, located at the future site for Reservoirs 1.4 and 1.5. This pump station will boost water from the ground-level tanks in to the Zone 1 distribution system. Backup power must be provided at this location, because the storage must be available to meet peak demands and fire flows on the east side of Zone 1. It is currently estimated that at buildout and under the high demand conditions, sufficient hydraulic capacity does not exist to move water all the way across Zone 1 from the gravity reservoirs located on the west side of the City. PS 1.2 must operate when hourly demand conditions exceed the flow provided by the water supply sources or during fire flows in the east side of Zone 1. In addition, PS 1.2 would be operated, as needed, under lower demand conditions to turn over reservoir storage for water quality purposes.

Pipelines

The City distribution system consists of pipelines with various sizes. The City currently maintains 164 miles of distribution mains. The original water mains were constructed in 1940 and range in size from four to 10 inches in diameter. Larger-diameter water mains have been constructed more recently. A 36-inch-diameter transmission main transports treated water from the new treatment facility as well as Randall-Bold WTP into the City's Zone 1 distribution system. Water is transported from the Zone 1 reservoirs to the downtown system by a 24-inch-diameter water main west of Fairview Avenue, which connects to a 20-inch-diameter water main along Dainty Avenue. A 16-inch-diameter water transmission main transports water from the northern wells south along State Route 4 to the downtown pipe grid system. The City currently has an ongoing program to replace sections of the original water mains in need of repair.

Capital costs for infrastructure needs to serve existing development are considered in the Water Rate Study for FY 2007/2008-2012/2013 (September 2007). The City has prepared a Water Master Plan (March 2006), which addresses infrastructure needs given current system conditions and anticipated growth. The City's water system infrastructure is generally in good condition.

The City's unaccounted for water system losses are estimated at 5-percent, which is an indicator of the integrity of the system. In general, industry standards set a benchmark at 10-percent for an acceptable level of system losses. The City has an Emergency Plan, approved April 2007, currently on file with the local County Department of Health Services, outlining appropriate response actions to protect utility services from emergencies such as: chlorine leaks, fires, earthquakes, civil disturbance, and loss of utilities.

<u>Water Treatment Plant</u>

The City has partnered with the CCWD for the new surface water treatment plant located north of Brentwood. The plant treats surface water supplies purchased by the City from the ECCID under an existing agreement that covers the City through buildout. The new water treatment plant shares facilities and infrastructure with the CCWD's Randall-Bold Water Treatment Plant. The water treatment plant was completed in July 2008. The plant will be expanded in the future, when needed, to meet increased demands.

The pump station associated with the water treatment plant pumps all treated surface water for the City into Zone 1, where the water passes through as needed to other zones. The first stage of the pump station construction consists of six one mgd pumps and one 15 mgd pump. Ultimately, the pump station will have a firm capacity of 36 mgd. As the new treated water pump station is online, the existing interim pump station at Empire Avenue and the Union Pacific Railroad is required for normal treated water supply. The City has emergency intertie capabilities with Diablo Water District at this location, but the pumping facilities will be removed.

Wastewater Collection and Treatment

The City of Brentwood owns and operates its wastewater collection, treatment and disposal system. The collection system, with approximately 138 miles of sewer main, conveys wastewater to the Brentwood Wastewater Treatment Plant (BWWTP) located on approximately 70 acres on the north side of the City adjacent to Marsh Creek. The BWWTP provides tertiary treatment and has an average dry weather flow capacity of 5.0 mgd. Effluent is pumped through the BWWTP as process water or pumped offsite as recycled water to be used for irrigation for landscaped areas in accordance with the City's Master Reclamation Permit. Any remaining treated wastewater is discharged into Marsh Creek. Marsh Creek is listed as an impaired water body on the Environmental Protection Agency's 303(d) list for mercury from Marsh Creek Reservoir to the San Joaquin River resulting from an abandoned mercury mine in the foothills of Mt. Diablo southwest of the Marsh Creek Reservoir. Table 4.9-5, below, summarizes the City's existing wastewater system facilities.

Table 4.9-5
City of Brentwood Wastewater System Overview

Quantity	
Sewer Mains	~138 miles
Pump Stations	3
Average Age of Collection System	10 years
Average Dry Weather Flow	3.35 mgd
Plant Design Capacity Average Dry Weather Flow	Current: 5 mgd Ultimate: 10 mgd
Water Reclamation & Effluent Disposal	Tertiary treatment discharge into Marsh Creek or used for irrigation

Source: *CCC LAFCO: Water and Wastewater Municipal Services Review for East Contra Costa County, October 2007.*

Recycled water is an important element in how the City manages its water resources to ensure a reliable water supply to meet current and future water demands as a result of growth. The BWWTP has tertiary treatment, providing recycled water for irrigation in landscape areas and other facilities. The City's 2005 Urban Water Management Plan projects a 780 percent increase in use from 323 AF/Yr to 2,520 AF/Yr in 2025.

The BWWTP is designed to have sufficient capacity to handle all wastewater flows at build-out per the General Plan. The Plant has a current treatment capacity of five mgd, and is designed to expand to 10 mgd in 2.5 mgd increments. Currently the Plant can handle a peak wet weather flow of 10 mgd. The Plant was expanded in 1998-2002, increasing treatment from a simple secondary treatment plant with a daily process capacity of two mg to a state of the art tertiary treatment facility with a capacity of five mgd. The Phase II expansion is under development, with completion expected in FY 2014/2015. This second phase will expand capacity to 7.5 mgd by adding oxidation ditches, secondary clarifiers, filters, and related appurtenances. In preparation for design, the City is completing a plant process optimization analysis to identify and evaluate any required modifications to the existing plant process. The analysis focuses on UV disinfection instead of chlorine, plant modifications, biosolids treatment and disposal options, alternate power generation options, and an overall biological assessment. This approach to planning allows the City to thoroughly evaluate the alternatives, and consider opportunities to proactively address anticipated additional restrictions the Central Valley RWQCB may impose on the City.

Capital costs for infrastructure needs to serve existing development are considered in the Sewer Rate Study for FY 2007/2008-2012/2013 (September 2007). The City recently updated the rate study and is also preparing an update to the Wastewater Collection System Master Plan, which will address infrastructure needs given current system conditions, anticipated growth, and regulatory changes. The Master Plan update is expected to be complete by 2009.

Other wastewater service challenges were not noted. Brentwood is preparing the mandated Sewer System Management Plan in accordance with the requirements of the SWRCB's General Waste Discharge Requirements for Sanitary Sewer Systems (Order No. 2006-0003-DWQ). The Plan includes an Overflow Emergency Response Plan to support an orderly, effective response to SSOs.

Storm Drainage

The proposed project is within the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD) Drainage Area (DA) 52C.

Construction and maintenance of drainage infrastructure in the drainage areas is guided by their respective Master Plans prepared by CCCFCWCD. A CCCFCWCD drainage fee study[7] applies to the proposed project boundaries.

Most of the developed and developable areas for this study are within the City of Brentwood. Drainage Areas 30C, 52A, 52B, 52C, and 104 thru 108 drain to Marsh Creek and collect a Marsh Creek Watershed Regional Drainage Fee to construct the remaining regional drainage facilities in the Marsh Creek Watershed. The remaining Marsh Creek Watershed regional drainage facilities include Upper Sand Creek Basin, Lower Sand Creek Basin, Deer Creek Reservoir expansion, Marsh Creek Reservoir rehabilitation, and Marsh Creek Channel expansion. New developments pay their drainage fees at building permit phase or final map phase and the money is deposited into the Drainage Deficiency Fund. The District's drainage fees are updated annually on January 1 to account for inflation.

The Drainage Boundary Plans prepared for the various drainage areas identify future storm drain lines and in some cases detention basins that would need to be constructed to serve future buildout in the areas utilizing monies collected from drainage fees paid by private developers.

Solid Waste Collection and Disposal

The City of Brentwood is responsible for all solid waste collection within the City limits. Solid waste in some newly incorporated portions of the City is collected by a private garbage collection company, the Brentwood Disposal Service but will ultimately be serviced by Brentwood per the agreement between the City and Brentwood Disposal Service.

The City of Brentwood has a transfer station with capacity to handle 400 tons per day of municipal solid waste (MSW), which is located on the north side of Sunset Road east of Marsh Creek. All the MSW collected by the City goes to this transfer station. The MSW delivered to the transfer station is checked for potentially hazardous waste material, and transferred onto larger trucks for ultimate disposal at a sanitary landfill or processed elsewhere. The City of Brentwood intends to maintain existing contractual agreements with Delta Diablo Sanitary District to provide household hazardous waste collection and disposal services in the community. The transfer station would therefore not be used to collect, store or process household hazardous waste, other than the limited quantities that may inadvertently be picked up in City collection trucks. City collection crews would have primary responsibility for inspecting loads prior to transferring into collection trucks. The City would continue an existing program to recycle large household appliances dropped off at the transfer station with appropriate handling of hazardous and potentially hazardous materials, such as Freon, by a licensed contractor to the City.

The City of Brentwood presently disposes and/or processes MSW (garbage and green waste) at the Keller Canyon County landfill within the City of Pittsburg, operated by Republic Services (formerly Allied Waste Systems). Occasionally, the waste could be taken to the Vasco Road landfill and the Forward landfill in Stanislaus County. It is currently estimated that the Keller Canyon and the Forward landfill have a lifetime of 40 years each and the Vasco Road landfill has a lifetime of 20 years (40 years with expansion possibilities).

Recyclable material is trucked to Pacific Rim Recycling via Republic Services or another Republic Services facility. The waste collected by the Brentwood Disposal Service from the unincorporated areas is taken to the Contra Costa Transfer and Recycling Facility in Pittsburg and is then transferred to Potrero Hills landfill in Solano County for disposal.

In accordance with AB 939, which required municipalities to aggressively pursue MSW source reduction and recycling, the City has achieved a recycling factor of about 50 percent. The various solid waste management actions adopted by the City include, but are not limited to, recycling and yard waste programs for residents and businesses, public education and public outreach, school recycling, City office recycling programs, and purchasing facilities.

Other Utilities

The Pacific Gas and Electric Company (PG&E) is obligated by California Public Utilities Commission (CPUC) Rule 15 to extend services to all new developments. However, PG&E is

not required to distribute the services throughout the project site; rather, PG&E is only responsible for getting the electricity to the project site.

PG&E was contacted during the scoping process of the EIR in order to obtain comments and to identify existing PG&E facilities located in the proposed project boundaries. PG&E indicated that it owns and operates a 60kV wood pole line and transmission gas gathering lines, which are located within the proposed project area.[8] The 60kV pole line is located on the east side of Brentwood Boulevard and runs from Sunset Road north to Lone Tree Way. PG&E also owns a 12-inch gas transmission line that appears to be in the Marsh Creek Bridge or the vicinity of the bridge and runs from old Sunset Road (Jane Way) north over the bridge to Grant Street in Brentwood Boulevard. To promote the safe and reliable maintenance and operation of these utility facilities, the California Public Utilities Commission (CPUC) has mandated specific clearance requirements between utility facilities and surrounding objects or construction activities.

AT&T currently serves the City of Brentwood for all land-line telephone needs. AT&T's existing facilities are able to supply services to the City, and are comprised of one central office in Oakley and two main feeder routes consisting of both aerial and underground lines.

Comcast is the cable television provider for the City of Brentwood, and is able to provide cable service to every existing residential dwelling unit within the City. In addition, Comcast can provide cable service to any future residences or annexation area(s), upon the area(s) reaching a density of at least 30 dwelling units per mile, measured from Comcast's existing distribution cable. Comcast also offers cable service to all new or previously unserved homes and non-residential buildings within 150 feet of Comcast's existing distribution cable. The City requires developers to provide Comcast with written notice of issuance of building or development permits for any new developments that will require the provision of underground cable service.

Law Enforcement

The City of Brentwood Police Department provides public services for the Brentwood Community. The Department currently has 65 sworn personnel, including one Chief, two Captains, four Lieutenants, ten Sergeants, and 48 officers, 16 non-sworn personnel and approximately 20 volunteers.[9] The Brentwood Police Department has one station, which is located at 9100 Brentwood Boulevard. In 2007, the Brentwood Police Department responded to 27,532 police calls for service, had an average emergency response time of four minutes and 42 seconds, and for non-emergencies an average of eight minutes and 26 seconds. The Brentwood General Plan indicates that the law enforcement personnel shall be provided to maintain a force level of at least 1.5 officers per 1,000 population.

Fire Protection

The City of Brentwood receives fire protection from the East Contra Costa Fire Protection District (ECCFPD). The East Contra Costa Fire Protection District, which was formed in 2002 provides suppression, dispatches emergency services for a 250 square-mile area, including the City of Brentwood, and is the second largest fire service in the County. The district includes

eight stations and over 83 reserve/paid-on-call emergency staff. The ECCFPD was formed as a consolidation of three fire districts. The district currently maintains a ratio of 0.53 full-time career and 0.92 full-time career and reserve/paid-on-call sworn personnel per 1,000 citizens within the fire district. However, while there are 30 reserve/paid-on-call firefighters on the roster, they do not provide constant staffing on a regular basis. Firefighters are assigned station duty on a less than half-time basis (typically evenings and weekends), and otherwise respond from home or work via a "page-out system" as part of a secondary/tertiary response matrix.

Brentwood is currently served by Fire Station #52 at John Muir Parkway and Fire Station #54 at 739 First Street (planned for relocation). A third station, #53 on Shady Willow Lane north of Grant Street, is approved but is yet to be constructed.

Schools

Grades K-12

The City of Brentwood is served by three school districts: Brentwood, Knightsen, and Liberty. The project site is within the Brentwood and Liberty School Districts and is not located within the Knightsen School District service boundaries. The Brentwood Union School District provides school services for grades K-8 and the Liberty Union High School District provides services for grades 9-12.

According to a Facility Needs Assessment that was prepared on June 13, 2008, the High School District currently enrolls 6,795 students and has a total capacity of 5,988 students. The Liberty Union High School District currently plans to construct two additional schools based upon current population growth projections, the first of which would be constructed between Brentwood and Oakley.

Table 4.9-6 shows the recent student enrollment and the total student capacity for K-6 and 7-8 grade levels within the Brentwood Union School District.

Table 4.9-6
Brentwood Union School District Current Enrollment Capacity

Grade Levels	Students
K-6 Capacity	6,105
K-6 Enrollment	6,305
7-8 Capacity	1,798
7-8 Enrollment	1,800

Source: Jack Schrader & Associates, Facility Needs Assessment for Brentwood Union School District, June 13, 2008.

Based on the existing population of Brentwood and the existing enrollment in area schools, it is possible to estimate student generation rates for the Brentwood population. Table 4.9-7 includes the estimated student generation rates for single and multi families for the K-8 range, and the general estimated student generation rates for 9th through 12th grades in the City of Brentwood.

Table 4.9-7 Brentwood Student Generation Factors	
Grade Levels	**Student Generation Factor per Household**
Single-Family Detached Units	
K-6	0.365
7-8	0.102
9-12	0.217
Multi-Family Units	
K-6	0.315
7-8	0.067
9-12	0.073
Source: *Jack Schrader & Associates, Facility Needs Assessment for Brentwood Union School District, June 13, 2008.*	

Using the above generation rates and the existing General Plan Land Use Designations, the project site could result in a total of 81 students for the Brentwood Union School District (K-8) and 16 students for the Liberty Union High School District (9 – 12), if developed with the existing designations.

Brentwood Library

The Brentwood Library is the only public library located in the City of Brentwood. The Brentwood Library is part of the Contra Costa County Library system. This enables the relatively small Brentwood Library to access all of the other libraries that are part of the Contra Costa Library system to obtain information not found in the Brentwood Library, which has been requested by customers. The Brentwood Library has programs for nearly all ages ranging from toddlers (age 2) to adults. The library is open from 10 am to 8 pm Monday through Thursday and from 10 am to 6 pm on Friday and Saturday. The Brentwood Library is located at 751 Third Street, next to Liberty High School. It should be noted that relocation of the Brentwood Library is currently pending.

Parks and Recreation

Brentwood's parks are maintained by the Brentwood Parks and Recreation Department, established in 1999. The Brentwood General Plan establishes an overall community standard of five acres of total (neighborhood and community) park space per 1,000 residents. Based on the projected population of approximately 50,000 for 2007, and using the above service standard, the City should have approximately 250 acres of parks. As shown in Table 4.9-8, existing parks or parks currently in design within the City total approximately 228.31 acres. Using the above service standard, the City would need an additional 22.69 acres of park space to meet the needs of the current population.

Table 4.9-8
City of Brentwood Parks

Name	Built or In Design	Own/Lease No Design	Future Dedication	City Maintained
Almond Park	1.40			1.40
Amber Park	0.30			0.30
Anastasia Park	0.81			0.81
Appaloosa Park	0.94			0.94
Applehill Park	5.00			5.00
Apricot Park	0.25			0.25
Aquatic Complex	7.50			7.50
Arbor View Park	5.70			5.70
Baca Properties (Subd. 8982)			1.62	
Balfour-Guthrie Park	6.44			6.44
Barrington Parks (3)		6.91		
Berkshire Park	0.90			0.90
Black Gold Park	6.50			6.50
Blue Goose Park	5.04			5.04
Bridle Gate (Discovery Bldrs Subd. 8506)			5.12	
Caboose Park	1.02			1.02
Carmel Estates (Pulte Homes Subd. 8311)		1.70		
Celeste Park	1.90			1.90
Cherry Park	0.43			0.43
City Park	2.94			2.94
Cortona Park	0.33			0.33
Creekside Park	10.00			10.00
Creekside Trailhead	0.25			0.25
Curtis Tot Lot	0.26			0.26
Darby/Coventry Pocket Park	0.77			0.77
Egret Park	1.54			1.54
Empire School Park		5.02		
Fruitwood Park	0.61			0.61
Garin Park	6.40			6.40

Table 4.9-8
City of Brentwood Parks

Name	Built or In Design	Own/Lease No Design	Future Dedication	City Maintained
Gemini Park	0.78			0.78
Glory Park	1.01			1.01
Granville Green	1.76			1.76
Heartland Pocket Park	0.10			0.10
Heron Park	10.17			10.17
Homecoming Park	2.00			2.00
Ironhouse Staging Area (Meritage)	0.80			0.80
Kaleidoscope Park	0.80			0.80
King Park	4.50			4.50
Lake Park	1.60			1.60
Loma Vista Park (City owns .8 acre)	5.30			5.30
Mallard Park	1.70			1.70
Marsh Creek Staging Area	1.32			1.32
Marsh Creek Vista	0.50			0.50
McClarren Park	3.24			3.24
Medallion Park (Rose Garden)	0.83			0.83
Miwok Park	7.32			7.32
Oak Meadow Park	12.69			12.69
Orchard Park	5.14			5.14
Outrigger Circle Pocket Park	0.96			0.96
Palmilla Park (4 parks)		7.57		
Palomino Park	0.70			0.70
Peach Park	0.77			0.77
Prewett Ranch (2 parks)			4.26	
Rainbows End Park	0.80			0.80
Rolling Hills Park	2.20			2.20
Rose Garden Park	3.13			3.13
Sage Glen Park	2.00			2.00
San Marino (Staging Area)	0.20			0.20

Table 4.9-8
City of Brentwood Parks

Name	Built or In Design	Own/Lease No Design	Future Dedication	City Maintained
Sand Creek Park (Costello)		9.60		
Sand Creek Park (Lea)		9.13		
Seedling Park	1.40			1.40
Skate Park	0.50			0.50
Spirit Park	0.51			0.51
Steeplechase (Richmond Amer. Subd. 8674)	1.11			1.11
Steeplechase (Richmond Amer. Subd. 8674)	0.52			0.52
Steeplechase (Richmond Amer. Subd. 8674)	1.07			1.07
Stonehaven Park	0.15			0.15
Summerset Park		10.00		
Summerwood Park	4.00			4.00
Sunset Park Athletic Complex	38.00			38.00
Sweetgrass Pocket Park	0.25			0.25
Topaz Park	0.27			0.27
Veterans Park	10.05			10.05
Walnut Park	5.05			5.05
Wheatfield Park (Subd. 8546)	1.40			1.40
Windsor Park	0.50			0.50
Yokut Park (Centex)	1.25			1.25
Totals	**205.58**	**49.93**	**11.00**	**205.58**

Acres Owned 2008		Owned No Design	49.93
Acres as of 2008	255.51	Future Dedication	11.00
Population	50,000	**GRAND TOTAL**	**266.51**
Acres per 1,000	**5.11**		

Source: *Brentwood Parks and Recreation Department, Tammy D. Homan, September 6, 2007.*

The *Parks, Trails, and Recreation Master Plan* for the City of Brentwood includes development standards for various types of parks and related amenities, including neighborhood parks, community parks, sports parks, greenways, trails, and open space. As noted in Section 7.7 of Chapter 7, *Development Standards*, detention (or retention) basins may not be used to fulfill developer land dedications.

Regulatory Context

Existing policies, laws, and regulations that would apply to the proposed project are summarized below.

Federal

Clean Water Act (CWA) / National Pollutant Discharge Elimination System Permits (NPDES)

The CWA is the cornerstone of water quality protection in the United States. The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutants discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water." The CWA regulates discharges from "non-point source" and traditional "point source" facilities, such as municipal sewage plants and industrial facilities. The CWA makes it illegal to discharge pollutants from a point source to the waters of the United States. Section 402 of the Act creates the NPDES regulatory program. Point sources must obtain a discharge permit from the proper authority (usually a state, sometimes EPA, a tribe, or a territory). NPDES permits cover industrial and municipal discharges, discharges from storm sewer systems in larger cities, storm water associated with numerous kinds of industrial activity, runoff from construction sites disturbing more than one acre, mining operations, and animal feedlots and aquaculture facilities above certain thresholds. All so-called "indirect" dischargers are not required to obtain NPDES permits. An indirect discharger is one that sends its wastewater into a city sewer system, so it eventually goes to a sewage treatment plant (POTW). Though not regulated under NPDES, "indirect" discharges are covered by another CWA program, called pretreatment. "Indirect" dischargers send their wastewater into a city sewer system, which carries it to the municipal sewage treatment plant, through which it passes before entering surface water. Permit requirements for treatment are expressed as end-of-pipe conditions. This set of numbers reflects levels of three key parameters: (1) biochemical oxygen demand (BOD), (2) total suspended solids (TSS), and (3) pH acid/base balance. These levels can be achieved by well-operated sewage plants employing "secondary" treatment. Primary treatment involves screening and settling, while secondary treatment uses biological treatment in the form of "activated sludge."

National Pretreatment Program

The National Pretreatment Program is a cooperative effort of federal, State, and local regulatory environmental agencies established to protect water quality. The program is designed to reduce the level of pollutants discharged by industry and other non-domestic wastewater sources into municipal sewer systems, and thereby, reduce the amount of pollutants released into the environment through wastewater. The objectives of the program are to protect the Publicly Owned Treatment Works (POTW) from pollutants that may interfere with plant operation, to prevent pollutants that may pass through untreated from being introduced into the POTW, and to improve opportunities for the POTW to reuse wastewater and sludges that are generated. The term "pretreatment" refers to the requirement that non-domestic sources discharging wastewater

to POTWs control their discharges, and meet limits established by EPA, the State or local authority on the amount of pollutants allowed to be discharged. The control of the pollutants may necessitate treatment prior to discharge to the POTW (therefore the term "pretreatment"). Limits may be met by the non-domestic source through pollution prevention techniques (product substitution recycle and reuse of materials) or treatment of the wastewater.

The Federal Safe Drinking Water Act (SDWA), which was enacted in 1974, gives the United States Environmental Protection Agency (EPA) the authority to set standards for contaminants in drinking water supplies. The SDWA was amended in 1986 and amended and reauthorized in 1996. For each of the 83 contaminants listed in the SDWA, the EPA sets a maximum contaminant level or treatment technique for contaminants in drinking water.

State

SB 610/SB 221

Senate Bills 610 and 221, which took effect January 1, 2002, require, specific information about water availability be presented and considered by land use agencies during the processing of certain land use entitlement applications. SB 610 and SB 221 apply to projects that include more than 500 residential units.

SB 610

SB 610 refers to numerous details that must be addressed in the water supply assessment, which are described in portions of the amended Water Code §10910:

> (d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts. (2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system […] shall be demonstrated by providing information related to all of the following: (A) Written contracts or other proof of entitlement to an identified water supply. (B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system. (C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply. (D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.
>
> (e) If no water has been received in prior years by the public water system […] under the existing water supply entitlements, water rights, or water service contracts, the public water system […] shall also include in its water supply assessment […] an identification of the other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water…

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.

A water supply assessment shall not be required to include the information required by this paragraph if the public water system determines…that the sufficiency of groundwater necessary to meet the initial and project demand associated with the project was addressed in [its urban water management plan].

SB 221

SB 221 requires supporting documentation of verification that sufficient water supplies are available for a project. SB 221 provides that in determining whether water supply is sufficient, the water agency shall consider a myriad of factors:

(A) The availability of water supplies over a historical record of at least 20 years.

(B) The applicability of an urban water shortage contingency analysis […] that includes actions to be undertaken by the public water system in response to water supply shortages.

(C) The reduction in water supply allocated to a specific water use sector pursuant to a resolution or ordinance adopted, or a contract entered into, by the public water system […]

(D) The amount of water that the water supplier can reasonably rely on receiving from other water supply projects, such as conjunctive use, reclaimed water, water conservation, and water transfer, including programs identified under federal, state, and local water initiatives such as CALFED and Colorado River tentative agreements [...]

If the water agency relies upon water supplies not then available to it, then the written verification must be based on the following elements, to the extent each is applicable:

(1) Written contracts or other proof of valid rights to the identified water supply that identify the terms and conditions under which the water will be available to serve the proposed subdivision.

(2) Copies of a capital outlay program for financing the delivery of a sufficient water supply that has been adopted by the applicable governing body.

(3) Securing of applicable federal, state, or local permits for construction of necessary infrastructure associated with supplying a sufficient water supply.

(4) Any necessary regulatory approvals that are required in order to be able to convey or deliver sufficient water supply to the subdivision.

If water supply for the proposed subdivision includes groundwater, the public water system shall also evaluate, based on substantial evidence, the extent to which it or the landowner has the right to extract the additional groundwater needed to supply the proposed subdivision.

The water agency's written verification must also "include a description, to the extent that data is reasonably available based on published records maintained by federal and state agencies, and public records of local agencies, of the reasonably foreseeable impacts of the proposed subdivision on the availability of water resources for agricultural and industrial uses within the public water system's service area that are not currently

receiving water from the public water system but are utilizing the same sources of water." The water agency may rely upon a prior CEQA document for this analysis.

If the water agency determines that water supplies are insufficient, the local agency may override that decision. "The local agency may make a finding [based on substantial evidence], after consideration of the written verification by the applicable public water system, that additional water supplies not accounted for by the public water system are, or will be, available prior to completion of the subdivision that will satisfy the requirements of this section."

Fire Services

Uniform Fire Code

The Uniform Fire Code contains regulations relating to construction, maintenance, and use of buildings. Topics addressed in the Code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions intended to protect and assist fire responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings and the surrounding premises. The Code contains specialized technical regulations related to fire and life safety.

California Health and Safety Code

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, include regulations for building standards (as also set forth in the California Building Code), fire protection and notification systems, fire protection devices such as extinguishers and smoke alarms, high-rise building and childcare facility standards, and fire suppression training.

Schools

California Code of Regulations

The California Code of Regulations, Title 5 Education Code, governs all aspects of education within the State.

Proposition 1A/Senate Bill 50

Proposition 1A/Senate Bill (SB) 50 (Chapter 407, Statutes of 1998) is a school construction measure authorizing the expenditure of State bonds totaling $9.2 billion through 2002, primarily for modernization and rehabilitation of older school facilities and construction of new school facilities. $2.5 billion is for higher education facilities and $6.7 billion is for K-12 facilities. Proposition 1A/SB 50 implemented significant fee reforms by amending the laws governing developer fees and school mitigation.

- Establishes the base (statutory) amount (indexed for inflation) of allowable developer fees at $1.93 per square foot for residential construction and $0.31 per square foot for commercial construction.
- Prohibits school districts, cities, and counties from imposing school impact mitigation fees or other requirements in excess of or in addition to those provided in the statute.
- Suspends for a period of at least eight years (2006) a series of court decisions allowing cities and counties to deny or condition development approvals on grounds of inadequate school facilities when acting on certain types of entitlements.

Proposition 1A/SB 50 prohibits local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any "legislative or adjudicative act…involving …the planning, use, or development of real property" (Government Code 65996[b]). Additionally, a local agency cannot require participation in a Mello-Roos for school facilities; however, the statutory fee is reduced by the amount of any voluntary participation in a Mello-Roos. Satisfaction of the Proposition 1A/SB 50 statutory requirements by a developer is deemed to be "full and complete mitigation." The law identifies certain circumstances under which the statutory fee can be exceeded, including preparation and adoption of a "needs analysis," eligibility for State funding, and satisfaction of two of four requirements (post-January 1, 2000) identified in the law including year-round enrollment, general obligation bond measure on the ballot over the last four years that received 50 percent plus one of the votes cast, 20 percent of the classes in portable classrooms, or specified outstanding debt. Assuming a district qualifies for exceeding the statutory fee, the law establishes ultimate fee caps of 50 percent of costs where the State makes a 50 percent match, or 100 percent of costs where the State match is unavailable. District certification of payment of the applicable fee is required before the City or County can issue the building permit.

Proposition 55

Proposition 55 is a school construction measure passed in 2004 authorizing the sale of approximately $12.3 billion in bonds to fund qualified K-12 education facilities to relieve overcrowding and to repair older schools. Funds target areas of the greatest need and must be spent according to strict accountability measures. These bonds would be used only for eligible Projects. Approximately ten billion dollars would be allocated to K-12 schools, with the remaining 2.3 billion allocated to higher education facilities.

Department of Education Standards

The California Department of Education published the Guide to School Site Analysis and Development to establish a valid technique for determining acreage for new school development. Rather than assigning a strict student/acreage ratio, this guide provides flexible formulas that permit each district to tailor the Department's ratios as necessary to accommodate each district's individual conditions. The Department of Education also recommends that a site utilization study be prepared for the site, based on these formulas.

Local

City of Brentwood General Plan

The following applicable policies are from the City of Brentwood General Plan 2001-2021:

Growth Management Element

Goal 1 Facilities and Services – Adequate public facilities and services that are maintained or improved as Brentwood grows.

Policy 1.1 Municipal Services – Provide adequate public infrastructure (i.e. sewer, water, and storm drain) to meet the needs of existing and future development.

Policy 1.2 School Facilities – The City shall continue to work cooperatively with responsible Brentwood school districts to ensure needed school facilities are provided in conjunction with new residential development.

Policy 1.3 Park Planning – A variety of park facilities shall be provided in a timely manner in accordance with the pace of development as per the *Parks, Trails, and Recreation Master Plan.*

Policy 1.4 Public Safety (Police and Fire) – Police and fire protection services shall be provided in a manner that ensures that adequate response times are maintained for emergencies.

Policy 1.6 Growth Management – The City will require provision of concurrent infrastructure to address the impacts of development projects.

Community Facilities Element

Goal 1 Quality Facilities – Provide high quality community facilities to serve Brentwood's diverse existing and future needs.

Policy 1.1 New Development – Ensure new development participates in the provision and expansion of community facilities.

Policy 1.2 School Facilities – Adequate school facilities shall be provided in a timely manner in accordance with the pace of development.

Policy 1.3 Public Safety (Police and Fire) – Police and fire services shall be provided in a manner which ensures that adequate response times are maintained for emergencies.

Policy 1.6 Library and Cultural Facilities – Provide an environment in which community literacy and cultural opportunities are enhanced.

Policy 1.7 Park Planning – A variety of park facilities shall be provided in a timely manner in accordance with the pace of development.

Other Applicable Local Policy Documents

- City of Brentwood Urban Water Management Plan (2005);
- City of Brentwood Water Master Plan (2006);
- Contra Costa County LAFCO Municipal Service Review; and
- City of Brentwood Parks, Trails and Recreation Master Plan.

Impacts and Mitigation Measures

Standards of Significance

An impact to the public services and utilities of the proposed project area would be considered significant if the proposed project would:

- Increase demand on existing water supply and distribution facilities, such that the facilities cannot meet the demand;
- Adversely impact the wastewater delivery system and increase the wastewater capacity beyond the ability of the wastewater treatment plant;
- Increase the demand for additional law enforcement or fire protection services beyond the ability of the existing departments to provide adequate service;
- Increase the total number of students beyond the capacity of local school districts;
- Increase the demand for recreational uses beyond the existing or proposed parks and recreational facilities;
- Increase the demand for gas and electric services beyond serviceable levels; or
- Exceed the available provisions of local solid waste disposal/recycling agencies.

Method of Analysis

The following section evaluates the impacts of the proposed project on the existing public services that would occur if the project as currently proposed went into effect. Impact significance is determined by comparing project conditions to the existing conditions.

Project-Specific Impacts and Mitigation Measures

4.9-1 Adequate water supply and delivery for new residents.

According to the 2001 City of Brentwood General Plan Land Use Map, the proposed project area is designated for the development of up to approximately 175 residential

units and 60 acres of Office/Business Park land uses. Table 4.9-9 includes the projected water usage associated with the buildout of the proposed project site per existing General Plan land use designations. The total water demand for the proposed project site per the existing General Plan land use designations would be 0.47 AF/yr.

The proposed project includes a General Plan Amendment and rezone for the proposed project area in order to enable the development of up to approximately 608 residential units, 107,167 sq ft of retail, 87,911 sq ft of office, and 228,690 sq ft of institutional development. It should be noted that, as the institutional use may be a satellite college or extension, the institutional water demand for the project would be similar to office uses. As identified in Table 4.9-10, the projected demand for the land uses associated with the proposed project would be 0.66 AF/Yr. When compared to the anticipated water use figures projected for the existing Land Use designations for the proposed project area, the proposed project would result in a net increase in water demand of 0.19 AF/Yr (0.66 – 0.47).

Table 4.9-9
Projected Water Usage for the Proposed Project Site
(2001 General Plan Land Use Designations)

Residential	**Units**	**Gal/Unit/Yr**	**Total**
Very High Density	175	260	45,500
		Subtotal	*45,500*
Industrial	**Acreage**	**Gal/Acreage/Yr**	**Total**
Office/Business Park	60	1785	107,100
	60	*Subtotal*	*107,100*
		Grand Total	**152,600**
		AF/Yr =	**0.47**

Source: Brentwood Public Works Department, November 2008.

As shown in Table 4.9-1, the City currently maintains an excess water supply of 4,283 AF/Yr during normal conditions. This excess supply is expected to grow to 16,833 AF/Yr in 2025 for normal, single dry, and multiple dry-year conditions. The increased demand of 0.41 AF/Yr associated with the development of the proposed project combined with a total cumulative demand in the multiple dry year condition of 14,724 AF/Yr for a total cumulative plus proposed project water demand of 14,724.4 AF/Yr would be well within the City's total 2025 supply of 31,557 AF/Yr.

The total water supplies shown in Table 4.9-10 are based upon the increase in water supplies associated with the new Water Treatment Plant that was recently completed. The applicant would pay fair-share development fees which would provide the funds necessary to continue the construction of already planned facility expansions.

Table 4.9-10
Water Usage for the Proposed Sciortino Ranch Project

Residential	**Units**	**Gal/Unit**	**Total**
High Density	140	410-260	46,900
Very High and Medium Density	468	260	121,810
	608	***Subtotal***	***168,710***
Industrial	**Acreage**	**Gal/Acreage**	**Total**
Office	5.1	1,785	9,104
Retail	9.8	1,785	17,493
Institutional	10.5	1,785	18,743
	25.4	***Subtotal***	***45,340***
	Grand Total (Gallons per year)		**214,050**
		Acre-Feet =	0.66

Source: Brentwood Public Works Department, November 2008.

The applicant would be required to pay the City water impact fees in effect at the time that building permits are issued. The water supply impact fees were established to fund the City's capital improvement projects related to the expansion of water infrastructure needed to serve the full buildout of the City. The additional water demand created by the proposed project would not exceed the City's future water supply. However, the project would require adequately sized water supply mains and connection of existing infrastructure to infrastructure for the proposed project. Therefore, the water supply impacts associated with the proposed project would be ***potentially significant***.

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

4.9-1(a) *Prior to issuance of building permits, the applicant shall be required to pay the City's Water Development Impact Fees.*

4.9-1(b) *Prior to issuance of building permits, the applicant shall construct and/or show proof of payment of fair-share fees for sizing and construction of water infrastructure to service the project, for review and approval of the Public Works Department.*

4.9-2 Adequate wastewater facilities for new residents.

The existing wastewater treatment plant (WWTP) is located on approximately 70 acres of land owned by the City on the north side of Sunset Road and east of State Route 4. The BWWTP is designed to have sufficient capacity to handle all wastewater flows at build-out per the General Plan. The BWWTP has a current treatment capacity of 5 mgd with an average dry weather flow of 3.335 mgd. The current system is designed to expand to 10 mgd in 2.5 mgd increments. Phase one of the wastewater plant expansion was completed in 2002 to bring the treatment plant to current levels. The Phase II expansion is under

development, with completion expected in FY 2014/2015. This second phase will expand capacity to 7.5 mgd. The final stage would be expected to be completed by 2025 and would bring the BWWTP capacity to 10 mgd.

The current wastewater projections for the City of Brentwood are based upon the land uses designated in the 2001 City of Brentwood General Plan. The General Plan Land Use Map designates the proposed project area for the development of up to approximately 175 residential units and 60 acres of Office/Business Park land uses. The projected wastewater demand for the proposed project area based upon the existing General Plan land use designations is expected to reach 153,510 gallons per day (See Table 4.9-11). It should be noted that, as the institutional use may be a satellite college or extension, the institutional wastewater generation for the project would be similar to office uses.

Table 4.9-11
Wastewater Generation for Existing Land Uses –
2001 General Plan Land Use Designations

Residential	**Units**	**Persons/Unit**	**GPCPD**	**Total**
Very High Density	175	3.12	85	46,410
Office/Business Park	**Acreage**	**GPD/Acre**		**Total**
Office/Business Park	60	1,785		107,100
		Grand Total (gallons/day)		**153,510**

Source: Brentwood Public Works Department, November 2008.

The proposed project includes a General Plan Amendment and rezone for the proposed project area in order to enable the development of up to approximately 608 residential units, 107,167 sq ft of retail, 87,911 sq ft of office, and 228,690 sq ft of institutional development. As identified in Table 4.9-12, the projected wastewater demand for the land uses associated with the proposed project is 205,528 gallons per day. When compared to the wastewater generation figures projected for the existing Land Use designations for the proposed project area, the proposed project would result in a net increase in wastewater demand of 71,814 gallons per day.

As stated previously, the current dry weather flows for the Brentwood WWTP are approximately 3.36 mgd with a capacity of 5 mgd, supporting a surplus capacity of 1.64 mgd. This capacity is expected to be further expanded to 7.5 mgd by 2015 and to reach 10 mgd by 2025. The proposed project would increase wastewater flows beyond the levels anticipated by 53,052 gallons per day. Given the current average flows and capacity of the Brentwood WWTP, the City has determined that the increase in wastewater generated by the proposed project would be within the current available capacity of the WWTP and that the future improvements to the WWTP would ensure adequate wastewater infrastructure to support the buildout of the proposed project.

Table 4.9-12
Wastewater Generation for the Proposed Sciortino Ranch Project

Residential	**Units**	**Persons/Unit**	**GPCPD**	**Total**
High Density	140	3.12	85	37,128
Very High and Medium Density	468	3.12	85	124,114
	608	*Subtotal*		*161,242*
Office/Retail	**Acreage**	**GPD/Acre**		**Total**
Office	5.1	1,785		9,104
Retail	9.8	1,785		17,493
Institutional	10.5	1,785		18,723
	25.4	*Subtotal*		*45,320*
		Grand Total (gallons/day)		**206,562**

Source: Brentwood Public Works Department, November 2008.

Although the WWTP has adequate capacity to serve the project's needs, the City is continually in the process of expanding the capacity of the plant to meet the ultimate demands created by buildout of the General Plan. Therefore, the City of Brentwood requires developers to pay fees toward the further expansion of the WWTP and the provision of conveyance infrastructure. The proposed project would be required to pay the City wastewater impact fees in accordance with City standards. The wastewater impact fees were established to fund the City's capital improvement projects related to the expansion of wastewater infrastructure needed to serve the full buildout of the City. Because the additional wastewater demand created by the proposed project would not exceed the City's wastewater supply capacity, the applicant would be required to pay applicable development fees to ensure the future development and expansion of wastewater capacity infrastructure within the City of Brentwood. Therefore, without payment of fair-share portions of water impact fees the wastewater supply impacts associated with the proposed project would be ***potentially significant***.

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

4.9-2(a) *Prior to issuance of building permits, the applicant shall be required to pay the City's Wastewater Impact Development Impact Fees.*

4.9-2(b) *Prior to issuance of building permits, the applicant shall construct and/or show proof of payment of fair-share fees for sizing and construction of wastewater infrastructure to service the project, for review and approval of the Public Works Department.*

4.9-3 Adequate storm drainage facilities for the proposed project.

A 27-inch storm drain line is located within the Sand Creek Road right-of-way west of the intersection of Brentwood Boulevard and Sand Creek Road. The proposed project area is within a CCCFCWCD drainage area and would be required to pay drainage fees

in effect at the time of issuance of building permits and construct necessary storm drain improvements, the final design of which will be determined by the Contra Costa County Flood Control and Water Conservation District (CCFCWCD) per the applicable CCCFCWCD Master Plan. The existing and proposed storm drain pipes associated with the project site ultimately route stormwater to the Marsh Creek channel. The capacity and ultimate design of the drainage system for the area has been determined by CCCFCWCD based upon the amount of impervious surface area resulting from buildout of the area per existing Land Use Designations. The total amount of impervious surface area within the Sciortino Ranch project site that could be generated per 2001 General Plan land use designations, has been estimated by City of Brentwood Public Works Department at 2,154,086 square feet (See Table 4.9-13).

Table 4.9-13
Impervious Surface Area for the Proposed Project Site (2001 General Plan Land Use Designations) Compared to the Proposed Project

Existing Land Uses - 2001 General Plan Land Use Designations			
Residential	**Acres**	**% Impervious**	**Total Sq. Feet Imp.**
Very High Density	7	74%	162,000
		Subtotal	**162,000**
COI	**Acres**	**% Impervious**	**Total Sq. Feet Imp.**
Office/Business Park	60	76%	1,992,086
		Subtotal	1,992,086
Grand Total Of Impervious Square Feet			**2,154,086**
Proposed Sciortino Ranch Land Use Plan			
Residential	**Acres**	**% Impervious**	**Total Sq. Feet Imp.**
High Density	14.1	70%	429,937
Very High and Medium Density	15.6	74%	502,857
		Subtotal	**932,794**
COI	**Acres**	**% Impervious**	**Total Sq. Feet Imp.**
Office	5.1	76%	168,839
Retail	9.8	95%	405,544
Institutional	10.5	76%	347,609
		Subtotal	**921,991**
Grand Total Of Impervious Square Feet			**1,854,785**

Source: Brentwood Public Works Department, 2008.

The amount of impervious surface area resulting from the proposed project has been estimated at 1,854,785 square feet. Therefore, the project is anticipated to result in a net decrease in the amount of impervious surface area. As a result, the capacity of the downstream storm drain system, including Marsh Creek, will be able to accommodate the stormwater runoff generated by the proposed project.

The applicant would be required to pay applicable drainage fees and would be required to construct infrastructure improvements, consistent with the improvements identified in the

District's master plans, the impacts related to storm drainage facilities within the specific plan would be considered to be ***less-than-significant***.

Mitigation Measure(s)
None required.

4.9-4 Need for additional waste disposal/recycling services.

The increase in population associated with the proposed project would increase the generation of solid wastes. The Brentwood General Plan EIR (3.7-15) states that the implementation of Brentwood's Source Reduction and Recycling Element would reduce the impact on the landfills resulting from General Plan buildout. However, the demand at the landfills would be substantially greater than existing conditions, given the amount of growth projected in the Brentwood Planning Area. With buildout of the General Plan, approximately 290,000 pounds per day of solid waste would be generated.

Implementation of the project would result in the projected generation of approximately 7,506.3 pounds of solid waste per day, as well as construction waste (See Table 4.9-14).

Table 4.9-14
Solid Waste

Land Use	Usage Area	Generation Rate	Volume of Solid Waste Produced (tons/year)
Residential	608 Dwelling Units	0.73 tons/per unit/per year	443.8
Office	87,991 square feet	1 lbs/100 sf/day	156.6
Retail	107,267 square feet	2.5 lbs/100 sf/day	477.3
Institutional	228,690 square feet	0.7 lbs/100 sf/day	292.2
Total			**1,369.9 tons/year**
Total			**7,506.3 lbs/day**

Source: *www.ciwmb.ca.gov, accessed on December 19, 2007.*

The solid waste from Brentwood is disposed of at the Keller Canyon Landfill. Currently, the capacity of the landfill is sufficient to handle the wastes of Brentwood and neighboring jurisdictions. Brentwood also has access to other landfills. Each of these landfills has at least 20 years of capacity and, thus, collectively these landfills would be able to accept Brentwood's future municipal solid waste.

The 2001 General Plan EIR determined that solid waste capacity is adequate to serve the demand resulting from General Plan buildout. Though the proposed project would be expected to increase the generation of solid waste in the proposed project area when compared to the waste that would be generated from buildout of the project area per the existing General Plan land use designations, the existing landfills would be expected to have adequate capacity to accommodate the increased waste associated with the proposed project. Furthermore, the Keller Canyon Landfill, which receives the City's MSW, currently handles 2,500 tons of waste per day, although the permit allows up to 3,500 tons of waste per day to be managed at the facility.[10] Buildout of the proposed project would generate less than 10 tons of solid waste per day, which is well within the excess

capacity at the Keller Canyon Landfill. Therefore, the project's impact to solid waste would be ***less-than-significant.***

Mitigation Measure(s)
None required.

4.9-5 Adequate ratio of law enforcement personnel to residents.

The proposed project is located within the jurisdiction of and is currently provided services by the Brentwood Police Department. The proposed project would add up to approximately 608 new residential units in the City of Brentwood. Applying the Brentwood standard of 3.12 average persons per household, the proposed project would add approximately 1,897 residents. In order to maintain a ratio of at least 1.5 officers per 1,000 people in the City, an additional 2.8 officers would be required. The applicant would be required to pay their fair share toward the provision of adequate police staffing and associated equipment through participation in the most current Community Facilities District. Therefore, without payment of City fees, a ***potentially significant*** impact would occur.

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

4.9-5 *Prior to issuance of building permits, the applicant shall participate in an existing or new CFD, to the satisfaction of the City Engineer.*

4.9-6 Adequate fire protection services available to new residents.

The East Contra Costa Fire Protection District (ECCFPD) strives to achieve a standard five-minute response time, 90 percent of the time (Contra Costa County General Plan 7-25). In 2006, the ECCFPD received a total of 4,807 emergency calls and maintained an average response time of seven minutes within the City of Brentwood. Brentwood is currently served by Fire Stations #52 at 201 John Muir Parkway, #54 at 739 First Street, and soon to be constructed #53 on Shady Willow Lane north of Grant Street. The Station 54 relocation and new Station #53 will help to provide faster fire protection services within the project area by providing service staff in closer proximity.

Policy 1.3 of the Brentwood General Plan states, "police and fire services shall be provided in a manner which ensures that adequate response times are maintained for emergencies." In order to maintain the District's goal of a five-minute response time 90 percent of the time, additional fire protection services would be required as a result of the introduction of approximately 1,897 new residents to the City. In addition to the need for more staffing and equipment, ECCFPD would need adequate site access and water flow in order to serve future development of the project site during construction and operation. Because detailed site plans have not been submitted at this time in order to enable a

determination as to whether adequate access and fire flow would be available, a ***potentially significant*** impact could occur.

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

4.9-6(a) *Prior to issuance of building permits, the applicant shall comply with all applicable requirements of the Uniform Fire Code and the adopted policies of the East Contra Costa Fire Protection District. The Chief Building Official shall review the building plans to ensure compliance.*

4.9-6(b) *Prior to issuance of building permits, the applicant shall provide an adequate and reliable water supply for fire protection with a minimum fire flow of 2,000 gallons per minute (GPM). The required fire flow shall be delivered from not more than two fire hydrants flowing simultaneously while maintaining 20 pounds of residual pressure in the main. The City Engineer shall ensure the minimum fire flow requirements are satisfied. Flow requirements will be determined by the ECCFPD prior to issuance of encroachment and/or building permits. The developer shall provide the number and type of fire hydrants required by ECCFPD and the City Engineer. Hydrant locations will be determined by the ECCFPD and the City Engineer prior to building and/or encroachment permit issuance. All applicable connection fees shall be paid at the time of permit issuance.*

4.9-6(c) *Prior to construction involving use of flammable materials, the developer shall provide access driveways having all-weather driving surfaces of not less than 20' unobstructed width and not less than 13'6" of vertical clearance to within 150 feet of travel distance to all portions of the exterior walls of every building. Access driveways shall not exceed 16 percent grade, shall have a minimum outside turning radius of 42 feet, and must be capable of supporting imposed loads of fire apparatus (37 tons). Center divide medians on any access roadways shall leave a minimum remaining lane width of 16 feet on each side. Median length shall not exceed 150 feet when a 16-foot lane width is used. A rolled curb and an unobstructed drivable surface on the median may be used to assist with meeting apparatus turning radius requirements. The City Engineer shall ensure compliance.*

4.9-6(d) *Prior to encroachment and/or building permit issuance for improvements, the developer shall submit plans and specifications to the ECCFPD and the City Engineer for review and approval in accordance with codes, regulations, and ordinances administered by the ECCFPD and the State Fire Marshal's office.*

4.9-7 Number of enrolled students exceeding capacity.

The project is located within the Liberty Union High School District and the Brentwood Union School District. The proposed project could generate an estimated 608 dwelling units, adding to the demand for services provided by the Liberty Union High School District and the Brentwood Union School District. The student generation rates for single-family detached units for the different grade categories are 0.365 for K-6, 0.102 for 7-8, and 0.217 for 9-12. Based on these student generation rates, the proposed project is anticipated to generate 244 students for the Brentwood Union School District (grades K-8) and 64 students for the Liberty Union High School District (grades 9-12). As stated previously, the estimated student generation of the project site based on existing designations would be 81 (K-8) and 16 (9-12). Therefore, the proposed project would generate more students than previously anticipated for the site.

Many of the elementary schools and high schools in the Brentwood area are at or nearing capacity. However, the applicant would be required to pay applicable SB 50 fees to ensure adequate funding for local schools. Satisfaction of the Proposition 1A/SB 50 statutory requirements by a developer is deemed to be "full and complete mitigation." Therefore, without payment of SB 50 fees, the project's impacts to school facilities would result in a ***potentially significant*** impact.

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

4.9-7 *Prior to issuance of building permits, the applicant shall be required to pay school impact fees.*

4.9-8 Adequate provision of parks and recreation space for new residents.

The City of Brentwood General Plan encourages an urban form that is based on open space throughout and around the community. Development of the project site would result in new residences and consequently would increase the demand for neighborhood, community, and regional parks and other recreation facilities. The proposed project includes up to approximately 608 dwelling units, as well as 195,258 square feet of retail and office space. Applying the current Brentwood standard of 3.12 average persons per household (US Census 2000), the proposed project would have approximately 1,897 residents. The Brentwood General Plan recommends five acres of park per 1,000 residents. Therefore, the project would require approximately 9.5 acres of park space for the additional residents. The proposed land use plan for the project currently illustrates approximately 5.1 acres of parkland. Therefore, the project would require an additional 4.4 acres of parkland, and a ***potentially significant*** impact would occur.

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

4.9-8 *Prior to the recordation of final maps, the applicant shall either dedicate the required amount of park land or pay in lieu fees, for the review and approval of the Community Development Director and the Parks and Recreation Director.*

4.9-9 Project impacts on the City of Brentwood Library.

Brentwood currently has one public library located next to Liberty High School. Additional libraries exist within public schools located in the City of Brentwood; however, these libraries are intended to serve only the students. Therefore, the Brentwood library serves the needs for the entire general public of the City of Brentwood. Due to the relatively small size of the Brentwood Library, the library is often crowded. One benefit the library has is that the library is part of the Contra Costa County Library System and therefore the Brentwood library can access any other library within the Contra Costa County Library System to obtain needed materials.

The proposed project would introduce approximately 1,897 new residents to the City of Brentwood. The introduction of this number of new residents to the City of Brentwood would be expected to create an increased demand on the library's current limited material and personnel resources. Program 1.6.1 under Policy 1.6 of the Brentwood General Plan states that the City should work with the County to provide adequate library facilities and pursue supplemental funding sources. Without the proposed project's contribution of funds, a ***potentially significant*** impact would result to the Brentwood Library as a result of the development of the project.

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

4.9-9 *Prior to the recordation of final maps and/or issuance of building permits, the Applicant shall participate in an existing or new CFD at the discretion of the Community Development Director and the City Engineer.*

4.9-10 Impacts to natural gas and electric facilities.

The Pacific Gas and Electric Company (PG&E) is obligated by California Public Utilities Commission (CPUC) Rule 15 to extend services to all new developments. However, PG&E is not required to distribute the services throughout the project site; PG&E is only responsible for getting the electricity to the project site.

Natural gas and electricity are provided to the proposed project area by Pacific Gas and Electric (PG&E). PG&E owns and operates a 60kV wood pole line and transmission gas gathering lines that are located within the proposed project area. The 60kV pole line is located on the east side of Brentwood Boulevard and runs from Sunset Road north to Lone Tree Way. In addition, a 12-inch gas transmission line exists within the Marsh

Creek Bridge, or in the vicinity of the bridge, and runs from Old Sunset Road (Jane Way) north over the bridge to Grant Street in Brentwood Boulevard.

The development of the project would potentially include the relocation of existing gas and electrical infrastructure. Expansion of distribution and transmission lines and related facilities is a necessary consequence of growth and development. In addition to adding new distribution feeders, the range of electric system improvements needed to accommodate growth, improvements related to the proposed specific plan may include upgrading existing substation and transmission line equipment, expanding existing substations to their ultimate buildout capacity, and building new substations and interconnecting transmission lines. Comparable upgrades or additions needed to accommodate additional load on the gas system could include facilities such as regulator stations, odorizer stations, valve lots, distribution and transmission lines.

Because a determination cannot be made at this time as to the level of improvements needed for PG&E to fully serve the natural gas and electric needs resulting from buildout, the project would have a ***potentially significant*** impact. It should be noted that once the applicant constructs the needed improvements, PG&E has indicated that they will provide needed gas and electric service.

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

4.9-10(a) *Prior to issuance of building permits, applicants shall consult with PG&E and the City of Brentwood to determine the adequacy of existing natural gas and electric facilities to serve the project. The applicant shall be required to pay the project's fair share cost towards the construction of needed improvements identified by PG&E and the City of Brentwood.*

4.9-10(b) *Prior to initiation of construction activities, the project contractor shall coordinate with PG&E and the City Engineer to identify the location of existing PG&E utilities and determine if relocation of utilities is necessary. If relocation is deemed necessary, prior to construction within existing PG&E utility easements, the contractor shall work with PG&E and the City Engineer to establish a utilities relocation plan, which shall include methods to ensure the provision of utilities during construction of the project.*

4.9-11 Impacts to telephone and cable service.

Development of the project would require the extension of telephone and/or cable lines to provide needed services. The applicant would be responsible for funding the extension of existing utilities in order to receive needed services. For the City of Brentwood, cable and phone lines are typically installed via a joint-trench. Upon extension of the infrastructure, the telephone and cable service providers would be able to provide service to the new

development; therefore, impacts to telephone and cable service would be considered ***less-than-significant***.

Mitigation Measure(s)
None required.

Cumulative Impacts and Mitigation Measures

4.9-12 Increase in demand for additional public services and utilities as a result of the proposed project and other projects proposed in the Brentwood area.

The proposed project would increase the demand for public services and utilities. The City of Brentwood has adopted development fees consistent with State law in order to facilitate the provision of public services for projects consistent with the buildout of the General Plan. In addition, the City has a 5-Year Capital Improvement Program that includes key infrastructure improvements needed to ensure adequate public services and utility availability in the City. This section of the Draft EIR requires the payment of development fees and consultation with applicable service providers, when appropriate, to facilitate the provision of public services commensurate with new development. As mentioned above, the City is currently in the process of completing the new Brentwood Water Treatment Plant and upgrading the Wastewater Treatment Plant to provide capacity to serve buildout of the City. The applicant would be required to fund fair share toward these programmed improvements. Payment of fees and implementation of the City's Capital Improvement Program would ensure that the project's incremental contribution to cumulative public services impacts would be less than cumulatively considerable. Therefore, the project would have a ***less-than-significant*** cumulative impact.

Mitigation Measure(s)
None required.

Endnotes

[1] Brown and Caldwell. *2005 City of Brentwood Urban Water Management Plan.* January 2006.
[2] Contra Costa LAFCO. *East Contra Costa County Water and Wastewater Municipal Service Review for the City of Brentwood*. 2007.
[3] Camp Dresser & McKee, Inc. *City of Brentwood Water Master Plan*. March 14, 2006.
[4] City of Brentwood. *General Plan Update.* Amended through January 2006.
[5] City of Brentwood. *General Plan Update EIR.* June 25,2001.
[6] *City of Brentwood Urban Water Plan*, January 2005.
[7] Contra Costa County Flood Control and Water Conservation District. *Engineer's Report for Updating Drainage Fee Ordinances for Drainage Areas 30C, 52A, 52B, 52C, and 104 thru 108 in the Marsh Creek Watershed.* January 2006.
[8] Personal Communication with Leo De Long, Land Agent, PG&E. November 14, 2007.
[9] Personal Communication with Benjamin Tolero, Fields Operations Division, Brentwood Police Department. December 9, 2008.
[10] http://alliedwasteservicesofcontracostacounty.com/facilities_keller_canyon.cfm. December 10, 2007.

5. STATUTORILY REQUIRED SECTIONS

5 STATUTORILY REQUIRED SECTIONS

Introduction

The Statutorily Required Sections chapter includes brief discussions regarding those topics that are required to be included in an EIR, pursuant to *CEQA Guidelines* Section 15126.2. The chapter includes a discussion of the proposed project's potential to induce economic or population growth; in addition, the chapter includes lists of significant irreversible environmental changes, cumulative impacts, and significant and unavoidable impacts that would be caused by the proposed project.

Growth-Inducing Impacts

An EIR must discuss the ways in which a proposed project could foster economic or population growth in the vicinity of the project and how that growth would, in turn, affect the surrounding environment (See *CEQA Guidelines* Section 15126.2 [d]). Growth can be induced in a number of ways, including through the elimination of obstacles to growth, or through the stimulation of economic activity within the region. The discussion of the removal of obstacles to growth relates directly to the removal of infrastructure limitations or regulatory constraints that could result in growth unforeseen at the time of project approval.

A number of issues must be considered when assessing the growth-inducing effects of development plans, such as the proposed project. These issues include the following:

> **Elimination of Obstacles to Growth:** The extent to which infrastructure capacity provided to accommodate the proposed project would allow additional development in surrounding areas; and
>
> **Economic Effects**: The extent to which development of the proposed project could cause increased activity in the local or regional economy.

Growth-inducing impacts associated with the Sciortino Ranch project would be considered to be any effects of the project allowing for additional growth or increases in population beyond that proposed by the project or anticipated in the General Plan.

The elimination of either physical or regulatory obstacles to growth is considered to be a growth-inducing effect. A physical obstacle to growth typically involves the lack of public service infrastructure. The extension of public service infrastructure, including roadways, water mains, and sewer lines, into areas that are not currently provided with these services, would be expected to support new development. Similarly, the elimination or change to a regulatory obstacle, including existing growth and development policies, could result in new growth.

As of the 2000 U.S. Census, the population of the City of Brentwood was 25,619. The current population of Brentwood is estimated to be approximately 50,000. Development of the proposed project would result in an estimated increase of 1,897 residents to the City of Brentwood. The project would, therefore, result in a substantial increase in the population of the City of Brentwood.

As discussed in this Draft EIR, the project site is currently designated as Mixed-Use Business Park and Very High Density Residential in the City of Brentwood General Plan. Although the project would include the redesignation of some of the land uses within the project area, and buildout of the residential uses would directly contribute to the population of Brentwood resulting in growth within the City, the project site is already designated for urban development in the Brentwood General Plan. In addition, the project site is infill development within the Draft Brentwood Boulevard Specific Plan area and North Brentwood Redevelopment Area. Furthermore, the project would not require extension of infrastructure other than from existing adjacent use. Therefore, the growth-inducing impacts associated with the proposed project would be within the scope anticipated by the General Plan and a less-than-significant impact would result.

Cumulative Impacts

CEQA Guidelines Section 15130 requires that an EIR discuss the cumulative and long-term effects of the proposed project that adversely affect the environment. “Cumulative impacts” are defined as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” (*CEQA Guidelines*, § 15355; see also Pub. Resources Code, § 21083, subd. [b]) Stated another way, “a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts.” (*CEQA Guidelines*, § 15130, subd. [a][1])

“[I]ndividual effects may be changes resulting from a single project or a number of separate projects.” (*CEQA Guidelines*, § 15355, subd. (a).) “The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.” (*CEQA Guidelines*, § 15355, subd. [b])

The need for cumulative impact assessment reflects the fact that, although a project may cause an “individually limited” or “individually minor” incremental impact that, by itself, is not significant, the increment may be “cumulatively considerable,” and thus significant, when viewed together with environmental changes anticipated from past, present, and probable future projects. (*CEQA Guidelines*, §§ 15064, subd. [h][1], 15065, subd. [c], 15355, subd. [b]) This formulation indicates that particular impacts may be less-than-significant on a project-specific basis but significant on a cumulative basis, because their small incremental contribution, viewed against the larger backdrop, is cumulatively considerable.

The lead agency should define the relevant geographic area of inquiry for each impact category (id., § 15130, subd. [b][3]), and should then identify the universe of “past, present, and probable

future projects producing related or cumulative impacts" relevant to the various categories, either through the preparation of a "list" of such projects or through the use of "a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact." (id., subd. [b][1])

The possibility exists that the "cumulative impact" of multiple projects will be significant, but that the incremental contribution to that impact from a particular project (e.g., Base Project) may not itself be "cumulatively considerable." Thus, *CEQA Guidelines* Section 15064, subdivision (h)(5) states, "[t]he mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable." Therefore, it is not necessarily true that, even where cumulative impacts are significant, any level of incremental contribution must be deemed cumulatively considerable.

Sciortino Ranch Cumulative Setting

The geographic scope of the area for the Sciortino Ranch Draft EIR cumulative analyses includes the City of Brentwood. These boundaries have been chosen because the impacts of the project would occur within the boundaries of Brentwood. As a result, the traffic model for this Draft EIR, which assumes buildout of the Brentwood General Plan, includes reasonably foreseeable projects within the City of Brentwood and traffic volumes from buildout of the Draft Brentwood Boulevard Specific Plan. The list of projects accounted for in the technical analyses of this Draft EIR, as determined in consultation with the City, are listed below. It should be noted that the list is based on the data available at the time of preparing the technical analyses for the project.

- Towncentre Commons;
- Magnolia;
- Prewett Ranch;
- Delta Fence;
- Brentwood Center II;
- Pizzagoni Towing;
- Office Condo Buildings;
- Solid Waste Transfer Station; and
- Kendall Plaza.

Cumulative Impacts

Cumulative impacts are analyzed in each of the technical chapters of this Draft EIR (chapters 4.1 through 4.9) and are summarized below.

<u>Land Use</u>

Cumulative impacts related to land use are discussed in Chapter 4.1 of the Draft EIR, Impact 4.1-4. The Draft EIR found that the proposed project would change the intensity of land uses in the

Brentwood Planning Area by contributing to development. However, with the approval of the proposed General Plan Amendment to redesignate the project site, the project would be consistent with the General Plan. The General Plan EIR previously considered the project area for urban development, and other developments in the City, on a cumulative basis and has anticipated for growth. Given the land use controls and development standards presently in use within the City of Brentwood, cumulative land use impacts were determined to be less-than-significant.

Aesthetics

Cumulative impacts related to aesthetics are discussed in Chapter 4.2 of the Draft EIR, Impact 4.2-4. The Draft EIR concludes that the proposed project is not expected to significantly contribute to a cumulative change in the visual character of the City of Brentwood or the Contra Costa County region. Because the existing setting of the project area is urban and the project area is planned for continued urban uses at buildout, the larger context of the visual impact of the proposed project would not be considered cumulatively significant. Development of the project would be guided by the *Draft Sciortino Ranch Design Guidelines,* which would be approved in conjunction with the proposed project, and are intended to provide a framework for the development of the project site to ensure a stylistically consistent and cohesive mix of land uses, as well as to ensure integration of the proposed project within the existing fabric of the City of Brentwood. In addition, the *Draft Sciortino Ranch Design Guidelines* are intended to provide planning design tools to support and promote implementation of future mixed land uses within the PD-55 Zone, and be consistent with the North Brentwood Redevelopment Area and the pending Brentwood Boulevard Specific Plan (within which the project would most likely be located) policies and economic revitalization goals. Therefore, cumulative impacts related to aesthetics were determined to be less-than-significant.

Transportation and Circulation

Cumulative impacts related to transportation and circulation are discussed in Chapter 4.3 of the Draft EIR, Impact 4.3-8. The proposed project's cumulative scenario was found to result in potentially significant impacts at the following three study intersections: Brentwood Boulevard at Lone Tree Way; Brentwood Boulevard at Grant Street / Sunset Road; and Brentwood Boulevard at Sand Creek Road. However, the traffic analysis for the proposed project found that the project's cumulative impacts to nearby intersections and roadway segments would be reduced to less-than-significant levels through implementation of the mitigation measures included in the Draft EIR.

Air Quality

Cumulative impacts related to air quality are discussed in Chapter 4.4 of the Draft EIR, Impacts 4.4-4 and 4.4-5. The air quality impact analysis for the Draft EIR found that increases in vehicle traffic as a result of the proposed project would contribute cumulatively to the degradation of regional air quality. The addition of the up to 608 residential units and 423,948 square feet (s.f.) of commercial, office, and institutional uses would result in a significant cumulative impact to air quality. The implementation of the mitigation measures specified in the Air Quality chapter

(Chapter 4.4) would decrease the overall effect, but would not reduce the regional air quality and cumulative regional air quality impacts to a less-than-significant level. In addition, the Draft EIR found that increases in vehicle traffic as a result of the proposed project would contribute cumulatively to the emission of greenhouse gases (GHGs). However, even in a cumulative discussion of climate change, declaring an impact significant, or not significant, implies knowledge of the incremental effects of the proposed project on the global warming scenario. To determine whether the proposed project would have a significant impact associated with climate change, in light of the fact that significance thresholds for such an impact do not exist, would be speculative. In addition, measures for the reduction of GHGs are included in the project and additional recommendations are presented. It should be noted that implementation of the mitigation measures included in the Air Quality chapter would decrease the magnitude of the GHG emissions created by the project.

Noise

Cumulative impacts related to noise are discussed in Chapter 4.5 of the Draft EIR, Impact 4.5-8. The noise analysis for the Draft EIR determined that, unless mitigated, traffic noise generated by nearby roadways would result in increases in interior and exterior noise levels beyond levels deemed acceptable by the City of Brentwood General Plan. Because the proposed project would expose future residents to cumulatively considerable interior and exterior noise levels, the project would result in a potentially significant cumulative impact. Implementation of the mitigation measures included in the Draft EIR would reduce this impact to a less-than-significant level. In addition, due to the increased traffic that would result from the buildout of the area, future traffic noise levels are predicted to be higher than existing traffic noise levels. However, cumulative traffic noise level increases resulting from the proposed project are predicted to range from +0.1 dB to +10.3 dB Ldn, relative to cumulative no-project noise levels, which exceed thresholds of significance for noise levels. However, the proposed project would implement mitigation to reduce noise impacts to on-site uses from traffic noise along the Sand Creek Road extension. Therefore, the project is expected to have a less-than-significant cumulative impact associated with project-related traffic on existing noise-sensitive land uses.

Biological Resources

Cumulative impacts related to biological resources are discussed in Chapter 4.6 of the Draft EIR, Impact 4.6-9. The Brentwood General Plan EIR notes that cumulative impacts associated with the buildout of the Brentwood Planning Area, in which the proposed project is located, could have a significant impact on special-status species and sensitive habitats. Although the proposed project is located east of Brentwood Boulevard at the Sand Creek Road intersection, and according to the biological resources report prepared for the project, does not provide high quality habitat for most species, buildout of the proposed project could result in a loss of habitat for burrowing owl, Swainson's hawk, and other special-status plant and animal species. Therefore, the biological resources analysis for the Draft EIR found that, consistent with the conclusions of the General Plan EIR, cumulative development, including the proposed project, would have potentially significant cumulative impacts on biological resources. Implementation of the mitigation measures included in the Draft EIR would reduce the impacts to a less-than-significant level.

Cultural Resources

Cumulative impacts related to cultural resources are discussed in Chapter 4.7 of the Draft EIR, Impact 4.7-3. Construction of the proposed project has the potential to disturb or destroy currently unknown archeological resources that could potentially occur within the project site. The potential loss of cultural resources in combination with potential losses from other development throughout the City of Brentwood was identified as a significant impact in the Brentwood General Plan EIR. However, with the implementation of General Plan goals and policies related to the protection of cultural resources, the General Plan found the cumulative impact to be less-than-significant. The Cultural Resources chapter identified that the proposed project would have the potential to unearth previously unknown cultural resources. However, the potentially significant impact identified in the chapter is reduced to a less-than-significant impact with implementation of the mitigation measures presented.

Hazards

Cumulative impacts related to hazards are discussed in Chapter 4.8 of the Draft EIR, Impact 4.8-8. The Draft EIR indicates that the proposed project is located along State Route (SR) 4, where the routine transport of hazardous materials could occur. However, transport would be subject to federal, State, and local hazardous materials management requirements, which would minimize potential risks associated with increased hazardous materials use in the community, including potential effects, if any, on the proposed project. In addition, the transport would be expected to be diverted to the SR 4 Bypass in 2009 when all three segments are complete, which would minimize potential risks associated with increased hazardous materials use in the community. Therefore, implementation of the proposed project would have a less-than-significant impact associated with cumulative hazardous materials use.

Public Services and Utilities

Cumulative impacts related to public services are discussed in Chapter 4.9 of the Draft EIR, Impact 4.9-12. The Draft EIR acknowledges that the proposed project would increase the demand for public services and utilities; however, the City of Brentwood has adopted development fees consistent with State law in order to facilitate the provision of public services for projects, consistent with the buildout of the General Plan. In addition, the City has a five-year Capital Improvement Program that includes key infrastructure improvements needed to ensure adequate public services and utility availability in the City. The Public Services and Utilities chapter of the Draft EIR includes mitigation measures that require the payment of development fees and consultation with applicable service providers, when appropriate, to facilitate the provision of public services commensurate with new development. In addition, the applicant would be required to fund the project's fair share toward the City's programmed improvements. Payment of fees and implementation of the City's Capital Improvement Program would ensure that the project's incremental contribution to cumulative public services impacts would result in a less-than-significant cumulative impact.

Significant Irreversible Environmental Changes

CEQA Guidelines Section 15126.2(c) requires that this EIR consider significant irreversible environmental changes that would be caused by the proposed project, should it be implemented. An impact would be determined to be a significant and irreversible change in the environment if:

- Development of the project would involve a large commitment of nonrenewable resources;
- The primary and secondary impacts of development would generally commit future generations to similar uses (e.g., a highway provides access to a previously remote area);
- Development of the proposed project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project; or
- The phasing and eventual development of the project would result in an unjustified consumption of resources (e.g., the wasteful use of energy).

The proposed project would likely result in or contribute to the following irreversible environmental changes:

- Conversion of existing undeveloped land to suburban land uses, thus precluding alternative land uses in the future;
- Irreversible consumption of goods and services associated with the future consumers; and
- Irreversible consumption of energy and natural resources associated with the future employees and consumers.

Significant and Unavoidable Impacts

According to *CEQA Guidelines* Section 15126.2(b), a Draft EIR must include a description of those impacts identified as significant and unavoidable, should the proposed action be implemented. When the determination is made that either mitigation is not feasible or only partial mitigation is feasible, such that the impact is not reduced to a less-than-significant level, such impacts would be considered significant and unavoidable. This section identifies significant impacts that could not be eliminated or reduced to a less-than-significant level by mitigation measures imposed by the City. The final determination of the significance of impacts and the feasibility of mitigation measures would be made by the City as part of the City's certification action.

The significant and unavoidable impacts of the proposed project are listed below.

Air Quality

The discussion of Air Quality impacts, Chapter 4.4 of this Draft EIR, identified the following as significant and unavoidable impacts:

- Increased vehicle trips, which would increase regional daily emissions to levels above thresholds set by the Bay Area Air Quality Management District (BAAQMD); and
- Cumulative impacts to regional air quality.

Vehicle trips generated by the project would result in air pollutant emissions affecting the entire San Francisco Bay Air Basin. The project site is currently vacant. The project is expected to result in the construction of approximately 608 dwelling units and 423,948 square feet of commercial, office, and institutional uses. While the mixed-use design of the project would reduce the number of vehicle trips, the project is expected to generate an additional 13,129 net new daily vehicle trips. Regional emissions associated with project vehicle use have been calculated using the URBEMIS 2007 emission model.

The Bay Area Air Quality Management District has established thresholds of significance for ozone precursors and PM_{10} of 80 pounds per day. As shown in Chapter 4.4, Table 4.4-5, the proposed project emissions would exceed these thresholds of significance; therefore, the proposed project would have a significant and unavoidable cumulative impact on regional air quality.

6. ALTERNATIVES ANALYSIS

6 ALTERNATIVES ANALYSIS

Introduction

The primary intent of the alternatives evaluation in an EIR, as stated in *CEQA Guidelines* Section 15126.6(a), is to "[…] describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives [...]."

The following are the objectives for the Sciortino Ranch Project:

1. Establish zoning and Design Guidelines via amendments to the Planned Development Zone (PD-55) and the General Plan to allow future commercial and residential development.

2. Future construction of residential units and retail/office/institutional developments.

3. Enhance the economic success of the neighborhood commercial components near State Route 4 by including nearby dwelling units.

4. Provide a range of commercial and housing types to meet the needs of a diverse population;

5. Provide affordable housing consistent with City and State redevelopment laws.

6. Provide new development consistent with City and State redevelopment laws.

7. Provide retail shopping opportunities to serve the surrounding community.

8. Subdivide property into 11 new parcels in accordance with new zoning sub-areas.

The feasibility of an alternative may be determined based on a variety of factors including, but not limited to, site suitability, economic viability, availability of infrastructure, General Plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and site accessibility and control.

The *CEQA Guidelines* provide the following for discussing alternatives to a proposed project:

- An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives (*CEQA Guidelines* Section15126.6[a]).

- Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly (*CEQA Guidelines* Section15126.6[b]).

- The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination [...] Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts (*CEQA Guidelines* Section15126.6[c]).

- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison (*CEQA Guidelines* Section15126.6[d]).

- The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (*CEQA Guidelines* Section15126.6[e][1]).

- If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives (*CEQA Guidelines* Section15126.6[e][2]).

In addition, Section 15126.6(d) of the *CEQA Guidelines* states, "If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."

Selection of Alternatives

The requirement that an EIR evaluate alternatives to the proposed project or alternatives to the location of the proposed project is a broad one; the primary intent of the alternatives analysis is to disclose other ways that the objectives of the project could be attained while reducing the magnitude of, or avoiding, the environmental impacts of the proposed project. It should be noted that although the Alternatives would reduce the significant impacts, the impacts would remain significant and unavoidable. Alternatives that are included and evaluated in the EIR must be

feasible alternatives. However, the Public Resources Code and the *CEQA Guidelines* require the EIR to "set forth only those alternatives necessary to permit a reasoned choice." The *CEQA Guidelines* provide a definition for "a range of reasonable alternatives" and thus limit the number and type of alternatives that may need to be evaluated in a given EIR. According to the *CEQA Guidelines* Section 15126.6(f):

> The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determined could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making.

First and foremost, alternatives in an EIR must be feasible. In the context of *CEQA Public Resources Code* Section 21061.1, "feasible" is defined as:

> ...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.

Finally, an EIR is not required to analyze alternatives when the effects of the alternative "cannot be reasonably ascertained and whose implementation is remote and speculative."

Alternatives Considered But Dismissed

<u>Off-Site Alternative</u>

One of the requirements of CEQA is the assessment of the comparable environmental impacts of alternative locations for the "project." Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR. The project has been specifically designed to provide shopping opportunities for the surrounding community and near State Route 4. The express intent of the project precludes any consideration of off-site locations. As a result, a feasible off-site location for the proposed project does not exist. Furthermore, the project applicant does not own an alternative location on which to construct the proposed project. The Off-Site Alternative is thus dismissed from further analysis.

Alternatives Considered in this EIR

For this EIR, the alternatives considered include the following:

- No Project / No Build Alternative
- Commercial Alternative; and
- Residential Alternative.

A matrix of the impacts of these alternatives relative to the impacts of the proposed project is presented in Table 6-7. Environmental analysis of alternatives addresses feasible development scenarios and the varying potential impacts that would result.

No Project Alternative

CEQA requires the evaluation of the comparative impacts of the "No Project" alternative (CEQA Guidelines Section 15126.6 [e]). The No Project Alternative is defined in this instance as "no action taken on the proposed project" or "no build" on the project site. A No Project alternative in this case means that the site would remain in its current state; therefore, the development activity associated with the proposed project would not occur. A "no action taken on the proposed project" or the "no build" alternative is the type of No Project Alternative that is evaluated below for the proposed project. Therefore, under the No Project Alternative, the project site would remain vacant. While this alternative would not meet the project objectives, CEQA requires the alternative to be analyzed.

Aesthetics

The Draft EIR determined that development of the project was anticipated in the City of Brentwood General Plan Update EIR. The City of Brentwood General Plan EIR concluded that the implementation of the General Plan's goals and policies, in addition to adherence to mitigation measures, would reduce aesthetic impacts to a less-than-significant level. In addition, the project would be required to comply with the *Draft Sciortino Ranch Design Guidelines*. The project site would remain vacant under the No Project/No Build Alternative. Therefore, the No Project/No Build Alternative would result in fewer aesthetic impacts.

Land Use

The project site would remain vacant under the No Project Alternative and would not require a General Plan Amendment to change the existing land uses. Therefore, the No Project Alternative would not conflict with the Brentwood General Plan and would result in fewer land use impacts than the proposed project.

Transportation and Circulation

The No Project Alternative would not generate daily, AM peak-hour, or PM peak-hour trips. As a result, overall the No Project Alternative would be expected to result in fewer impacts to the study area intersections and roadways segments than the proposed project. It is important to note, however, that the Draft EIR determined that all traffic-related impacts could be reduced to a less-than-significant level for the proposed project with implementation of appropriate mitigation.

Air Quality

The No Project Alternative would not develop residential, retail commercial, office, or institutional uses which generate daily, AM peak-hour, or PM peak-hour trips. As a result, operational emissions associated with this Alternative would be less than the emissions generated by the

proposed project. Therefore, significant and unavoidable operational impacts would not result from implementation of the No Project Alternative. Overall, the No Project Alternative would have fewer air quality impacts as compared to the proposed project.

Noise

The No Project Alternative would not develop residential, retail commercial, office, or institutional uses. As a result, this Alternative would not generate construction or operational noise, thus the No Project Alternative would have fewer noise impacts than the proposed project. It is important to note, however, that the Draft EIR determined that all noise-related impacts could be reduced to a less-than-significant level for the proposed project with implementation of appropriate mitigation.

Biological Resources

The No Project Alternative would not develop the project site; therefore, this Alternative would not include construction activities that would disturb existing biological resources. The Alternative would not result in impacts to special-status plant species or special-status wildlife species, including burrowing owls, Swainson's hawks, raptors and migratory birds, and existing trees. Therefore, the No Project Alternative would have fewer overall impacts to biological resources. It is important to note, however, that the Draft EIR determined that all biological-related impacts could be reduced to a less-than-significant level for the proposed project with implementation of appropriate mitigation.

Historical and Cultural Resources

The No Project Alternative would not develop the project site; therefore, this Alternative would not include construction activities that would disturb known or unknown historical and/or cultural resources. Therefore, the No Project Alternative would have fewer impacts to historical and cultural resources as compared to the proposed project.

Hazards

The Draft EIR identified hazards associated with the presence of gas wells, above-ground storage tanks, soil contamination, potential underground storage tanks, septic systems, and ground shaking. The No Project Alternative would not develop residential, retail commercial, office, or institutional uses. Therefore, potentially significant hazards identified in the Draft EIR, such as on-site wells and other infrastructure would not pose a risk under the No Project/No Build Alternative. Therefore, compared to the proposed project, the No Project Alternative would have fewer impacts relating to on-site hazards.

Public Services and Utilities

Under the No Project Alternative, development of residential, retail commercial, office, or institutional uses would not occur. However, the proposed project would increase the population of the City to an even greater degree. The greater population growth associated with the proposed project would create a greater need for utilities and public services, such as water, wastewater, and

police and fire services. Therefore, the No Project Alternative would have fewer impacts to public services and utilities, relative to the proposed project.

Commercial Alternative

The Commercial Alternative would result in the development of the project site, but would remove office and institutional components of the proposed project and increase the acreage proposed for retail components of the project. This Alternative would include the development of 276,606 square feet (s.f.) of retail building area, which amounts to 169,339 s.f. more retail building area than proposed for the project. It is anticipated that additional retail uses would be located in the central portion of the project site, north of the Sand Creek Road extension, which is designated for office and institutional development as part of the proposed project. All other land use designations would remain the same as the proposed project (See Table 6-1).

Table 6-1
Commercial Alternative Land Use Assumptions for Analysis

Sub Areas	Acre age	Fixed Park Acreage	# of MFD Apartment (DUs)	# of SFH Detached (DUs)	Retail (Sq. Ft.)	Office (Sq. Ft.)	Institutional (Sq. Ft.)
Sub-Area # 1	9.4	-	-	-	102,366	-	-
Sub-Area # 2A	5.5	-	-	-	59,895	-	-
Sub-Area # 2B	10.5	-	-	-	114,345	-	-
Sub-Area # 3A	3.4	-	-	27	-	-	-
Sub-Area # 3B	3.3	-	-	40	-	-	-
Sub-Area # 4	10.1	-	303	-	-	-	-
Sub-Area # 5A	4.6	4.6	-	-	-	-	-
Sub-Area # 5B	0.5	0.5	-	-	-	-	-
Sub-Area # 6	5.5	-	165	-	-	-	-
Sub-Area # 7A	3.8	-	-	30	-	-	-
Sub-Area # 7B	3.6	-	-	43	-	-	-
TOTALS:	**60.2**	**5.1**	**468**	**140**	**276,606**	**-**	**-**

DU = Dwellings Units
Sq. Ft. = Square Feet
MFG = Multi-Family Dwellings
SFH = Single-Family Housing

Aesthetics

The proposed project site is currently vacant and is located in an urbanized developed area. Buildout under the Commercial Alternative would exclude office and institutional uses from being built and would result in the development of additional retail uses. Buildout under this Alternative would result in the construction of structures on the project site, but would not substantially alter existing views because development of the project site is anticipated in the City of Brentwood General Plan EIR. New sources of light and glare would be approximately the same under both this Alternative and the proposed project. Therefore, the Commercial Alternative would result in comparable impacts to aesthetics, relative to the proposed project.

Land Use

The proposed project site is currently vacant and is located in an urbanized developed area. Buildout under the Commercial Alternative would exclude office and institutional uses from being built and would result in the development of additional retail uses. Although the Commercial Alternative would locate more retail development adjacent to residential uses, the Alternative would not be expected to create significant impacts related to land use compatibility because the site is anticipated and analyzed for development in the City of Brentwood General Plan Update EIR. In addition, the project would be required to comply with the *Draft Sciortino Ranch Design Guidelines*, which address potential on-site land use incompatibilities. Therefore, the Commercial Alternative would result in roughly the same impacts as the proposed project.

Transportation and Circulation

Table 6-2 includes a breakdown of the vehicle trips that would be generated by the Commercial Alternative. Table 6-3 indicates the Commercial Alternative will generate 3,922 fewer daily, 660 fewer AM peak-hour, and 425 fewer PM peak-hour trips than the proposed project. Impacts on roadway facilities are based on hourly traffic volumes. As a result, the Commercial Alternative would be expected to result in fewer impacts to the study area intersections and roadway segments as compared to the proposed project. It is important to note, however, that the Draft EIR determined that all traffic-related impacts could be reduced to a less-than-significant level for the proposed project with implementation of appropriate mitigation.

Table 6-2
Commercial Alternative Trip Generation

ITE Land Use (Code)	Size	Total Daily Trips	AM Peak Hour					PM Peak Hour				
			Total Trips	IN		OUT		Total Trips	IN		OUT	
				%	Trips	%	Trips		%	Trips	%	Trips
Apartment	468.0	2,963	233	20%	47	80%	186	275	65%	179	35%	96
Single-Family Detatached Housing	140.0	1,417	107	25%	27	75%	81	145	63%	91	37%	54
Shopping Center	276.6	13,157	288	61%	176	39%	112	1,225	48%	588	52%	637
General Office Building	0.0	0	0	88%	0	12%	0	0	17%	0	83%	0
College	0.0	0	0	88%	0	12%	0	0	17%	0	83%	0
Subtotal New Trips:		***17,537***	***628***		***250***		***379***	***1,645***		***858***		***787***
Internal Reduction[1] (Daily, PM)	15% 16%	-2,629						-258		-135		-123
Pass-By Reduction[1] (LU 820)	34%	-4,473						-417		-200		-217
Alternate Mode Reduction	7%	-1,228	-44		-17		-27	-115		-60		-55
Net New External Trips:		***9,207***	***584***		***233***		***352***	***855***		***463***		***392***

Source: *Trip Generation, 7th Edition*, ITE.
[1] Based on methodology published in *Trip Generation Handbook, Second Edition*, ITE.

Table 6-3
Vehicle Trip Comparison - Proposed Project and Commercial Alternative

Alternative	Daily Trips	AM Trips	PM Trips
Proposed Project	13,129	1,244	1,280
Commercial Alternative	9,207	584	855
Difference from Proposed Project	*-3,922*	*-660*	*-425*

Air Quality

The Commercial Alternative would result in the development of additional retail acreage proposed for the project. As indicated in Table 6-3, the Commercial Alternative will generate 3,922 fewer daily, 660 fewer AM peak-hour, and 425 fewer PM peak-hour trips than the proposed project. As a result, operational emissions associated with this Alternative would be less than the emissions generated by the proposed project. However, the significant and unavoidable operational impacts would still result from implementation of both the proposed project and the Commercial Alternative. In addition, it should be noted that the Commercial Alternative would include the same transit, bicycle, and pedestrian amenities as those associated with the proposed project. Overall, the Commercial Alternative would have slightly decreased air quality impacts as compared to the proposed project.

Noise

The Commercial Alternative would result in the development of additional retail acreage proposed for the project. As indicated in Table 6-3, the Commercial Alternative will generate 3,922 fewer daily, 660 fewer AM peak-hour, and 425 fewer PM peak-hour trips than the proposed project. As a result, the Commercial Alternative would be expected to result in the fewer noise impacts to the study area intersections and roadway segments than the proposed project. It is important to note, however, that the Draft EIR determined that all traffic-related impacts could be reduced to a less-than-significant level for the proposed project with implementation of appropriate mitigation.

In addition, because the Commercial Alternative would include more retail uses, the Alternative would be expected to result in an increase in noise associated with on-site retail uses, such as HVAC units, loading docks, and parking lots. However, the Commercial Alternative would remove office and institutional uses which would generate similar noise. Therefore, the Commercial Alternative would be expected to generate equal retail, office, and institutional generated noise levels compared to the proposed project. Overall, the Commercial Alternative is expected to have fewer noise impacts to as compared to the proposed project.

Biological Resources

Although the Commercial Alternative would include a different balance of land uses than those proposed for the project, the Commercial Alternative would include the development of the same number of acres as the proposed project. The Commercial Alternative would still entail development of currently vacant land, as well as installation of utilities. This Alternative, similar to the proposed project, would have the potential to disturb existing biological resources on the project site. The Alternative, as well as the project, would create potential impacts to special-status plants and wildlife, native and Heritage trees, and a cumulative loss of biological resources in the project area. Therefore, under the Commercial Alternative, impacts to biological resources would be equal to impacts created by the proposed project.

Historical and Cultural Resources

Although the Commercial Alternative would include a different balance of land uses than those proposed for the project, the Commercial Alternative would include the development of the same number of acres as the proposed project. The Commercial Alternative would have the same potential to uncover unknown and undiscovered cultural resources on the project site; therefore, impacts to cultural resources would be equal to impacts created by the proposed project.

Hazards

The Commercial Alternative would result in the development of an equal number of residents and residences to the project site, as compared to the proposed project. In addition, the additional retail uses would replace the proposed institutional and offices uses. The Commercial Alternative would introduce equal sensitive receptors with close proximity to existing or potential hazardous materials, such as potential soil contamination and aboveground or underground storage tanks. Therefore, the Commercial Alternative would have equal impacts to the proposed project in regard to hazards.

Public Services and Utilities

Implementation of the Commercial Alternative would result in an equal number of residents on the project site, relative to the proposed project. In addition, the additional retail uses would replace the proposed institutional and offices uses. The additional retail uses would generate a similar demand for public services and utilities as the replaced institutional and office uses. Therefore, compared to the proposed project, the Commercial Alternative would create equal demand on public services and utilities in the project area, such as water, wastewater, schools, parks, and police and fire services. However, it should be noted that impacts to public services and utilities would be less-than-significant with implementation of the mitigation measures in this EIR for the proposed project. Overall, under the Commercial Alternative, impacts associated with public services and utilities would be equal compared to the impacts associated with the proposed project.

Residential Alternative

The Residential Alternative would result in the development of the project site, but would remove the office and institutional components of the project, and increase the acreage for the residential and retail components of the proposed project. This Alternative would include 162,261 s.f. of retail and 883 residential units, which is 54,994 s.f. and 275 residential units more than the proposed project. Additional residential and office uses would be located in the central portion of the project site, located north of the Sand Creek Road extension, replacing the institutional and office uses. All other land use designations would remain the same as the proposed project (See Table 6-4).

Table 6-4
Residential Alternative Land Use Assumptions for Analysis

Sub Areas	Acre age	Fixed Park Acreage	# of MFD Apartment (DUs)	# of SFH Detached (DUs)	Retail (Sq. Ft.)	Office (Sq. Ft.)	Institutional (Sq. Ft.)
Sub-Area # 1	9.4	-	-	-	102,366	-	-
Sub-Area # 2A	5.5	-	-	-	59,895	-	-
Sub-Area # 2B	10.5	-	315	-	-	-	-
Sub-Area # 3A	3.4	-	-	27	-	-	-
Sub-Area # 3B	3.3	-	-	40	-	-	-
Sub-Area # 4	10.1	-	303	-	-	-	-
Sub-Area # 5A	4.6	4.6	-	-	-	-	-
Sub-Area # 5B	0.5	0.5	-	-	-	-	-
Sub-Area # 6	5.5	-	165	-	-	-	-
Sub-Area # 7A	3.8	-	-	30	-	-	-
Sub-Area # 7B	3.6	-	-	43	-	-	-
TOTALS:	**60.2**	**5.1**	**783**	**140**	**162,261**	**-**	**-**

DU = Dwelling Units
Sq. Ft. = Square Feet
MFG = Multi-Family Dwellings
SFH = Single-Family Housing

Aesthetics

The proposed project site is currently vacant and is located in an urbanized developed area. Buildout under the Residential Alternative would exclude office and institutional uses from being built and would result in the development of additional retail and residential uses. Buildout under this Alternative would result in the construction of structures on the project site, but would not substantially alter existing views because development of the project site is anticipated in the City of Brentwood General Plan EIR. New sources of light and glare would be approximately the same under both the Alternative and the proposed project. Therefore, the Residential Alternative would result in comparable impacts to aesthetics, relative to the proposed project.

Land Use

The proposed project site is currently vacant and is located in an urbanized developed area. Buildout under the Residential Alternative would exclude office and institutional uses from being built and would result in the development of additional retail and residential uses. Although the Residential Alternative would develop additional retail development adjacent to residential uses, the Alternative would not be expected to create significant impacts related to land use compatibility because the site is anticipated and analyzed for development in the City of Brentwood General Plan Update EIR. In addition, the project would be required to comply with the *Draft Sciortino Ranch Design Guidelines* policies which address potential land use incompatibilities. Therefore, the Residential Alternative would result in roughly the same impacts as the proposed project.

Transportation and Circulation

Table 6-5 includes a breakdown of the vehicle trips that would be generated by the Residential Alternative. Table 6-6 indicates the Residential Alternative will generate 3,667 fewer daily, 590 fewer AM peak-hour, and 402 fewer PM peak-hour trips than the proposed project. Impacts on roadway facilities are based on hourly traffic volumes. As a result, the Residential Alternative would be expected to result in fewer impacts to the study area intersections and roadway segments than the proposed project. It is important to note, however, that the Draft EIR determined that all traffic-related impacts could be reduced to a less-than-significant level for the proposed project with implementation of appropriate mitigation. However, to identify specific impacts associated with this alternative, additional analysis may be required.

Table 6-5
Residential Alternative Trip Generation

ITE Land Use (Code)	Size	Total Daily Trips	AM Peak Hour					PM Peak Hour				
			Total Trips	IN		OUT		Total Trips	IN		OUT	
				%	Trips	%	Trips		%	Trips	%	Trips
Apartment	783.0	4,856	387	20%	77	80%	310	448	65%	291	35%	157
Single-Family Detatached Housing	140.0	1,417	107	25%	27	75%	81	145	63%	91	37%	54
Shopping Center	162.3	9,302	209	61%	128	39%	82	862	48%	414	52%	448
General Office Building	0.0	0	0	88%	0	12%	0	0	17%	0	83%	0
College	0.0	0	0	88%	0	12%	0	0	17%	0	83%	0
Subtotal New Trips:		***15,575***	***703***		***232***		***473***	***1,455***		***796***		***659***
Internal Reduction[1] (Daily, PM)	12% 13%	-1,860						-182		-100		-82
Pass-By Reduction[1] (LU 820)	34%	-3,163						-293		-141		-152
Alternate Mode Reduction	7%	-1,090	-49		-16		-33	-102		-56		-46
Net New External Trips:		***9,462***	***654***		***216***		***440***	***878***		***499***		***379***

Source: *Trip Generation, 7th Edition*, ITE.
[1] Based on methodology published in *Trip Generation Handbook, Second Edition*, ITE.

Table 6-6
Vehicle Trip Comparison - Proposed Project and Residential Alternative

Alternative	Daily Trips	AM Trips	PM Trips
Proposed Project	13,129	1,244	1,280
Residential Alternative	9,462	654	878
Difference from Proposed Project	*-3,667*	*-590*	*-402*

Air Quality

The Residential Alternative would result in the development of additional retail and residential acreage proposed for the project. As indicated in Table 6-6, the Residential Alternative will generate 3,667 fewer daily, 590 fewer AM peak-hour, and 402 fewer PM peak-hour trips than the proposed project. As a result, operational emissions associated with this Alternative would be fewer than the emissions generated by the proposed project. However, the significant and unavoidable operational impact would still result from implementation of both the proposed project and the Residential Alternative. In addition, it should be noted that the Residential Alternative would include the same transit, bicycle, and pedestrian amenities as those associated

with the proposed project. Overall, the Residential Alternative would have slightly decreased air quality impacts as compared to the proposed project.

Noise

The Residential Alternative would result in the development of additional retail and residential acreage on the project site. As indicated in Table 6-6, the Residential Alternative will generate 3,667 fewer daily, 590 fewer AM peak-hour, and 402 fewer PM peak-hour trips than the proposed project. As a result, the Residential Alternative would be expected to result in fewer noise impacts to the study area intersections and roadways segments than the proposed project. It is important to note, however, that the Draft EIR determined that all traffic-related impacts could be reduced to a less-than-significant level for the proposed project with implementation of appropriate mitigation. The Residential Alternative would have fewer impacts as compared to the proposed project.

Biological Resources

Although the Residential Alternative would include a different balance of land uses than those proposed for the project, the Residential Alternative would include the development of the same number of acres as the proposed project. The Residential Alternative would still entail development of currently vacant land, as well as installation of utilities. This Alternative, similar to the proposed project, would have the potential to disturb existing biological resources on the project site. The Alternative, as well as the project, would create potential impacts to special-status plants and wildlife, existing trees, and a cumulative loss of biological resources in the project area. Therefore, under the Residential Alternative, impacts to biological resources would be equal to impacts created by the proposed project.

Historical and Cultural Resources

Although the Residential Alternative would include a different balance of land uses than those proposed for the project, the Residential Alternative would include the development of the same number of acres as the proposed project. The Residential Alternative would have the same potential to uncover unknown and undiscovered cultural resources on the project site; therefore, impacts to cultural resources would be equal to impacts created by the proposed project.

Hazards

The Residential Alternative would result in the addition of a greater number of residents to the project site, as compared to the proposed project. The identified hazardous materials would still be removed prior to development. Therefore, the Residential Alternative would have the same impacts related to hazards and hazardous materials, relative to the proposed project.

Public Services and Utilities

Implementation of the Residential Alternative would result in a greater number of residents on the project site, relative to the proposed project. The additional residential and retail uses would replace the proposed institutional and office uses. However, the additional residential uses would

create additional demand on public services and utilities in the project area, such as water, wastewater, schools, parks, and police and fire services as compared to the proposed project. Overall, under the Residential Alternative, impacts associated with public services and utilities would be slightly greater compared to the impacts associated with the proposed project. However, it should be noted that impacts to public services and utilities would be less-than-significant with implementation of the mitigation measures in this EIR for the proposed project.

Environmentally Superior Alternative

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Section 15126(e)(2) of the *CEQA Guidelines* requires that an environmentally superior alternative be designated and states that "if the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."

Designating a superior alternative depends in large part on what environmental effects one considers most important. This EIR does not presume to make this determination; rather, the determinations of which impacts are more important are left to the reader and the decisionmakers. Finally, it should be noted that the environmental considerations are one portion of the factors that must be considered by the decisionmakers in deliberations on the proposed project and the alternatives. Other factors of importance include urban design, economics, social factors, and fiscal considerations.

It is important to note based upon Table 6-7 below that the Residential Alternative and Commercial Alternative would have similar overall impacts relative to the proposed project. For example, based on the above analysis, the Commercial Alternative may result in decreased impacts in three resource areas, as would the Residential Alternative. The Residential Alternative would be expected to result in increased impacts in two resource areas. Therefore, for this project, the Environmentally Superior Alternative has been selected based upon the differences in the impact categories. For example, the Commercial Alternative would have equal or slightly fewer impacts to public services and utilities as compared to the proposed project, while the Residential Alternative would have slightly increased impacts. In addition, the Commercial Alternative would result in fewer daily traffic trips, which would result in fewer air quality and noise impacts than the Residential Alternative. It should be noted that the No Project Alternative would reduce the most impacts; however, CEQA requires that an environmentally superior alternative be identified among the other alternatives. Given that impacts to traffic, air, and noise are complex and mitigation approaches to these types of issues are often difficult to implement, the Commercial Alternative would be considered the Environmentally Superior Alternative because said Alternative would slightly reduce impacts in these areas.

The Commercial Alternative and Residential Alternative would meet all of the project objectives. However, the No Project Alternative would not meet any of the project objectives.

Table 6-7
Environmental Impacts

Resource Area	Proposed Project (PP)	No Project Alternative	Commercial Alternative	Residential Alternative
Aesthetics	Less-Than-Significant	Fewer	Equal	Equal
Land Use	Less-Than-Significant With Mitigation	Fewer	Equal	Equal
Transportation and Circulation	Less-Than-Significant With Mitigation	Fewer	Fewer	Fewer
Air Quality	Significant and Unavoidable (project-level and cumulative operational emissions)	Fewer	Fewer*	Fewer*
Noise	Less-Than-Significant With Mitigation	Fewer	Fewer	Fewer
Biological Resources	Less-Than-Significant With Mitigation	Fewer	Equal	Equal
Historical and Cultural Resources	Less-Than-Significant With Mitigation	Fewer	Equal	Equal
Hazards	Less-Than-Significant With Mitigation	Fewer	Equal	Equal
Public Services and Utilities	Less-Than-Significant With Mitigation	Fewer	Equal	Greater

No Impact = "None" Less Than PP = "Fewer" Equal to PP = "Equal" Greater Than PP = "Greater"

** Significant and unavoidable impact determined for the proposed project would still be expected to occur.*

7. REFERENCES

7 REFERENCES

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8. EIR AUTHORS AND PERSONS CONSULTED

8 EIR AUTHORS AND PERSONS CONSULTED

Lead Agency – City of Brentwood

Erik Nolthenius, Principal Planner	Community Development Department
Paul Eldredge, P.E., Assistant City Engineer	Public Works Department
Steve Kersevan, P.E., Traffic Manager	Public Works Department

Environmental Impact Report Consultants

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Cindy Gnos, AICP, Vice President	Raney Planning & Management, Inc.
Nick Pappani, Division Manager	Raney Planning & Management, Inc.
Rod Stinson, Assistant Division Manager	Raney Planning & Management, Inc.
Ariel Calvert, Associate	Raney Planning & Management, Inc.
David Lee, Associate	Raney Planning & Management, Inc.
Darlene Corbitt, Project Coordinator	Raney Planning & Management, Inc.

Traffic Analysis

Steve Pyburn, CE, TE, Project Manager	Kimley-Horn & Associates, Inc.

Noise Analysis

Jim Brennan, President	j.c. brennan & associates, Inc.
Luke Saxelby, Senior Consultant	j.c. brennan & associates, Inc.

Biological Analysis

Amy Richey, Biologist	Mosaic Associates LLC
Judy Bendix, Biologist	Mosaic Associates LLC

Arborist Report

Michael Baefsky, Certified Arborist	Baefsky & Associates, Environmental Consultants

Cultural Resources Analysis

Katherine Flynn	Archeological Resource Service

Hazards Analysis

Peter J. McIntyre, Director of Environmental Services	AEI Consultants
Nathan R. Ferguson, Project Manager	AEI Consultants

Kenneth C. Ferrone, P.E., Geologist	Stevens, Ferrone & Bailey Engineering
Patrick Stevens, P.E., Geotechnical Engineer	Stevens, Ferrone & Bailey Engineering

APPENDIX A

DATE: November 10, 2008

TO: Responsible Agencies, Trustee Agencies, and Interested Persons

FROM: Erik Nolthenius, Principal Planner, City of Brentwood

SUBJECT: NOTICE OF PREPRARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED SCIORTINO RANCH PROJECT

The City of Brentwood, Community Development Department, is the lead agency for the preparation of an Environmental Impact Report (EIR) for the Sciortino Ranch project (proposed project), including the proposed General Plan and Zoning Amendments and related entitlements. The scope of the EIR has been proposed based on a determination by the City of Brentwood. The City of Brentwood has directed the preparation of an EIR in compliance with the California Environmental Quality Act (CEQA).

Once a decision is made to prepare an EIR, the lead agency must prepare a Notice of Preparation (NOP) to inform all responsible and trustee agencies that an EIR will be prepared (CEQA Guidelines Section 15082). The purpose of the NOP is to provide agencies with sufficient information describing both the proposed project and the potential environmental effects to enable the agencies to make a meaningful response as to the scope and content of the information to be included in the EIR. The City of Brentwood is also soliciting comments on the scope of the EIR from interested persons.

SCOPING MEETING

A public scoping meeting will be held regarding the proposed EIR for the Sciortino Ranch project on November 21, 2008 at 3 p.m. at the City of Brentwood Council Chambers located at 734 Third Street, Brentwood, California, 94513.

PROJECT DESCRIPTION

Project Location and Setting

The proposed Sciortino Ranch project is located within the northeastern portion of the City of Brentwood. The City of Brentwood is located in the eastern valley area of Contra Costa County immediately east of the Diablo Range, on the western edge of the San Joaquin Valley (See Figure 1, Regional Location Map). The City has historically been surrounded by agricultural land uses consisting primarily of row crops, orchards, and grazing lands. The City's planning area is

located southeast of Antioch and south of the City of Oakley and Bethel Island. The planning area consists of approximately 66 square miles, and is characterized by the relatively flat terrain of the Central Valley, with gently sloping hills in the western and southwestern portion of the area approaching the foothills of the Diablo Range. The tree-studded slopes and grassy rolling hills of the eastern portion of the Diablo Range, comprise the surrounding visual character of Brentwood. Rising to an elevation of 3,849 feet above sea level, Mount Diablo is the main visual feature outside the Brentwood planning area, and is a prominent landmark dominating the western skyline.

The proposed project site is within the North Brentwood Redevelopment Area, Special Planning Area (SPA) A, and also within the limits of the proposed Brentwood Boulevard Specific Plan (BBSP) area, for which a draft specific plan policy document has been prepared and is currently being finalized by the City. The project site is located at the intersection of Sand Creek Road and Brentwood Boulevard (State Route 4) and is approximately 65 acres. The project site consists of two legal parcels, identified by Assessor's Parcel Numbers (APNs) 016-170-011and 016-170-013 (See Figure 2, Project Location Map). The proposed project site is surrounded by residential development to the north, east and south with commercial to the west.

The project site primarily consists of vacant land. However, a natural gas well and irrigation well exist in the northeastern portion of the site. In addition, evidence of a former agricultural residence – associated buildings and an inactive water well – is located near the western boundary of the site. The site has been disked, and was historically used for agriculture.

Project Entitlements

The entitlements requested with this application include:

1) Certification of the EIR;
2) Approval of a General Plan Amendment;
3) Approval of an amendment to the Planned Development (PD) -55 zone inclusive of a Sub-Area Map, Zoning Matrix, and associated Design Guidelines; and
4) Approval of a Vesting Tentative Subdivision Map to subdivide one legal parcel (inclusive of APNs 016-170-011 and -012) into 11 legal parcels. (New parcels would be consistent with proposed Planned Development zoning areas.)

Project Components

The proposed project includes General Plan and PD zone amendments that would permit park, multi-family residential and single-family residential, retail, office, commercial, and/or institutional uses on the project site. The project site's existing General Plan land use designations include Mixed-Use Business Park and Very High Density Residential; therefore, the project would require a General Plan Amendment. The relevant General Plan text would be modified to reflect the proposed amendment to the Special Planning Area (SPA-A) description. The General Plan Land Use Diagram would also be amended to reflect the land use designations being requested for the project site. The PD-55 Zone would be modified to provide 11 zoning sub-areas and applicable development standards. In addition, the project would include a Vesting Tentative Subdivision Map that subdivides one legal parcel (inclusive of APNs 016-170-011 and -012) into 11 new parcels, consistent with the proposed PD-55 sub-zone areas (See Figure 3, PD-55 Zoning – Development Sub Area Map). Future development of the site would include the extension of Sand Creek Road, which would traverse the site from east to west.

Figure 1
Regional Location Map

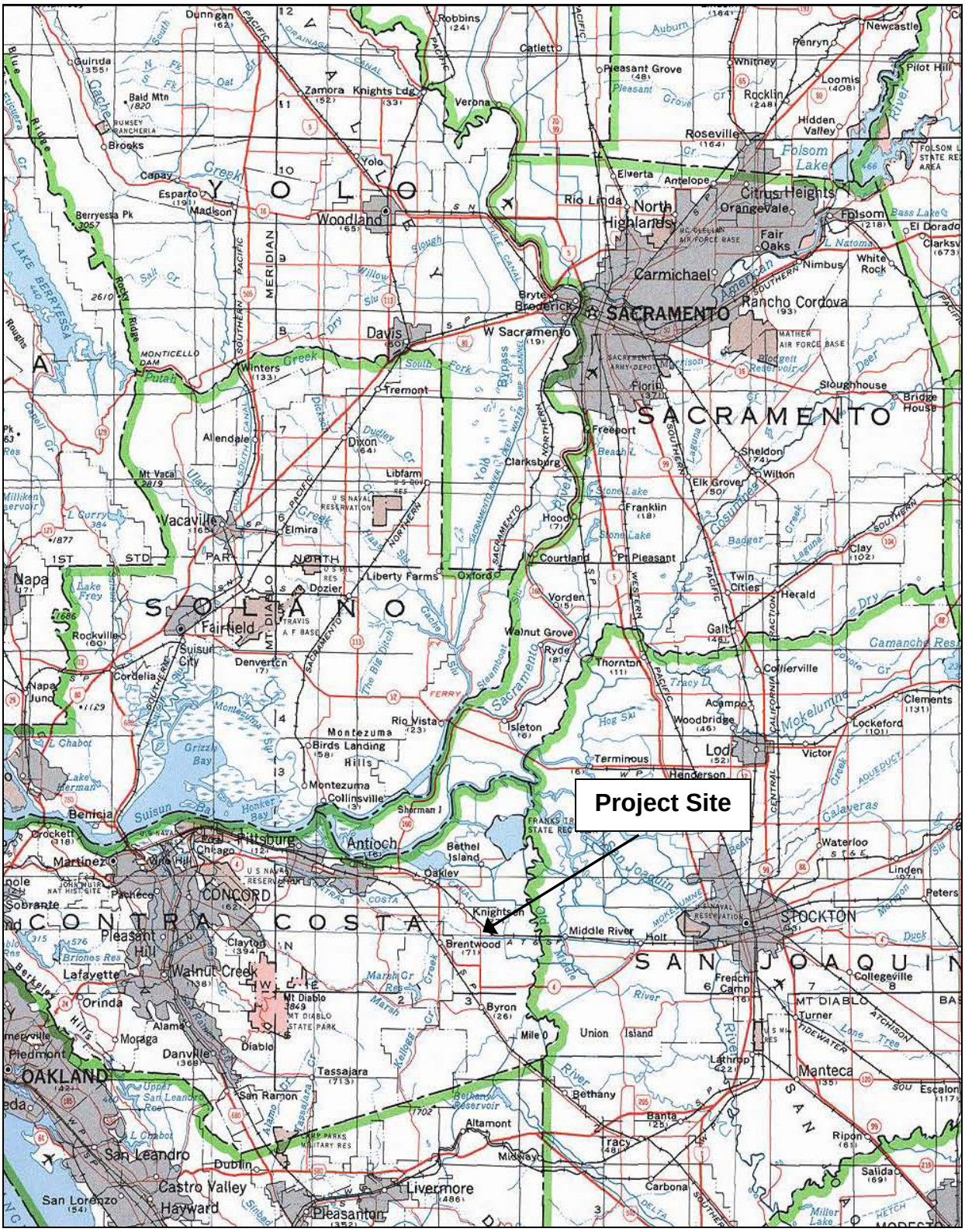
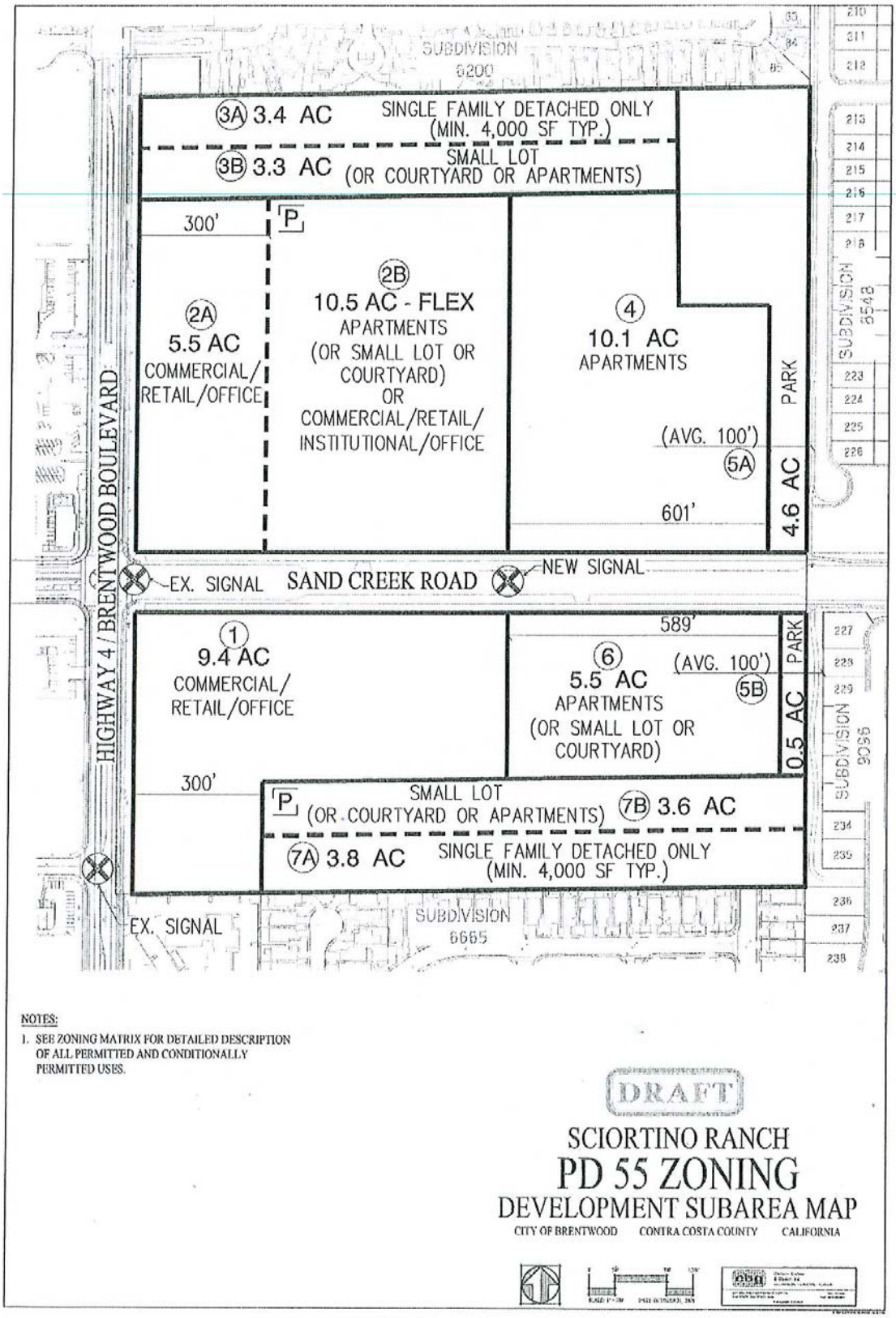

Project Site
SACRAMENTO
YOLO
SOLANO
CONTRA COSTA
SAN JOAQUIN
Woodland
Davis
Vacaville
Fairfield
Antioch
Pittsburg
CONCORD
Walnut Creek
Pleasant Hill
Martinez
Benicia
Napa
Vallejo
OAKLAND
San Leandro
Hayward
Castro Valley
Pleasanton
Livermore
Dublin
Tracy
Manteca
STOCKTON
Lodi
Galt
Elk Grove
Folsom
Roseville
Rocklin
Carmichael
Rancho Cordova
Citrus Heights
Orangevale
Fair Oaks
Rio Linda
North Highlands
Elverta
Antelope
Clarksburg
Freeport
Courtland
Walnut Grove
Isleton
Rio Vista
Knightsen
Brentwood
Oakley
Bethel Island
Byron
Bethany
Altamont
Mountain House
Tracy
Ripon
Salida
Escalon
Lathrop
Manteca
Stockton
Linden
Lockeford
Clements
Woodbridge
Acampo
Thornton
Terminous
Henderson
Collierville
Galt
Herald
Twin Cities
Vorden
Courtland
Pt Pleasant
Franklin
Hood
Sheldon
Wilton
Elk Grove
Clay
Florin
Sloughhouse
Bridge House
Rancho Cordova
Nimbus
Fair Oaks
Folsom
Citrus Heights
Orangevale
Antelope
Roseville
Rocklin
Loomis
Penryn
Newcastle
Pilot Hill
Whitney
Pleasant Grove
Catlett
Robbins
Dunnigan
Zamora
Knights Ldg
Verona
Yolo
Esparto
Madison
Capay
Brooks
Guinda
Bald Mtn
Berryessa Pk
Winters
Tremont
Dixon
Allendale
Mt Vaca
Elmira
Dozier
Liberty Farms
Oxford
Rockville
Suisun City
Cordelia
Denverton
Montezuma
Birds Landing
Collinsville
Sherman I
Hills
Clayton
Lafayette
Orinda
Moraga
Alamo
Danville
Diablo
Pleasant Hill
Pacheco
Sobrante
Crockett
Port Chicago
Mare Island
Tassajara
San Ramon
Dublin
San Lorenzo
Union Island
Mile 0
Middle River
Holt
Collegeville
French Camp
Turner
Lathrop
Banta
Carbona
Waterloo
Peters
Victor
Terminous
Henderson
Lodi
Galt
Thornton
Tracy
Byron
Bethany
Altamont
Midway
Livermore
Pleasanton
Dublin
Castro Valley
Hayward
San Leandro
San Ramon
Tassajara
Danville
Alamo
Moraga
Orinda
Lafayette
Walnut Creek
Pleasant Hill
Martinez
Pacheco
Concord
Pittsburg
Antioch
Benicia
Napa
Vacaville
Woodland
Davis
Winters
Dixon
Fairfield
Suisun City
Rio Vista
Isleton
Knightsen
Brentwood
Oakley
Bethel Island
Byron
Bethany
Altamont
Tracy
Ripon
Salida
Escalon
Manteca
Stockton
Lodi
Galt
Elk Grove
Folsom
Roseville
Rocklin
Carmichael
Rancho Cordova
Citrus Heights
Orangevale
Fair Oaks
Rio Linda
North Highlands
Elverta
Antelope
Clarksburg
Freeport
Courtland
Walnut Grove
Isleton
Rio Vista

Figure 2
Project Location Map

Figure 3
PD 55 Zoning – Development Sub Area Map



The proposed project could ultimately be built out with a variety of uses including, but not limited to, single-family and multi-family residences, retail/office/commercial uses, institutional uses, and park uses. The applicant has provided three probable scenarios for the potential mix of land uses that could occur on the proposed project site. For the purposes of this analysis, the EIR will use a conservative approach and assume the most intense level of development, as shown in Table 1, below. The assumptions in Table 1 will be used to assess impacts to transportation and circulation and, subsequently, noise and air quality. Analysis of the potential development includes 5.1 acres of park uses, 468 multi-family apartments, 140 single-family detached homes, 91 affordable residential units, 195,258 square feet of retail/office/commercial uses, and 228,690 square feet of institutional uses (most likely a community college). It should be noted that the other two scenarios will be assessed in the Alternatives chapter of the EIR.

Table 1
Land Use Assumptions for Analysis

Sub Areas	Acreage	Fixed Park Acreage	# of MFD Apartment (DUs)	# of SFH Detached (DUs)	Retail (Sq. Ft.)	Office (Sq. Ft.)	Institutional (Sq. Ft.)
Sub-Area # 1	9.4	-	-	-	47,372	87,991	-
Sub-Area # 2A	5.5	-	-	-	59,895	-	-
Sub-Area # 2B	10.5	-	-	-	-	-	228,690
Sub-Area # 3A	3.4	-	-	27	-	-	-
Sub-Area # 3B	3.3	-	-	40	-	-	-
Sub-Area # 4	10.1	-	303	-	-	-	-
Sub-Area # 5A	4.6	4.6	-	-	-	-	-
Sub-Area # 5B	0.5	0.5	-	-	-	-	-
Sub-Area # 6	5.5	-	165	-	-	-	-
Sub-Area # 7A	3.8	-	-	30	-	-	-
Sub-Area # 7B	3.6	-	-	43	-	-	-
TOTALS:	**60.2**	**5.1**	**468**	**140**	**107,267**	**87,991**	**228,690**

DU = Dwelling Units
Sq. Ft. = Square Feet
MFG = Multi-Family Dwellings
SFH = Single-Family Housing

ENVIRONMENTAL EFFECTS

The EIR for the proposed project will incorporate by reference the prior General Plan (GP) EIR to the extent impacts from this project were previously addressed or analyzed therein, and will address only those subjects where impacts may remain significant or where there are new environmental impacts based on more detailed project information. To the extent these issues were not addressed in the GP EIR, the environmental analysis is proposed to focus on the technical environmental issues listed below. It should be noted that the findings/conclusions of this project-level EIR are anticipated to be consistent with those in the not-yet-certified program-level Brentwood Boulevard Specific Plan EIR.

Land Use

The Land Use chapter of the EIR will evaluate the consistency of the proposed project with the City of Brentwood's adopted plans and policies. A review of the City's General Plan and Zoning Ordinance, as well as any other appropriate documents such as the proposed Brentwood Boulevard Specific Plan (currently in draft form) will be addressed for consistency issues. The chapter will further assess the compatibility of the proposed project with the surrounding land uses, both existing and proposed. In addition, the Land Use chapter will identify land use impacts and mitigation measures and will note any inconsistencies or incompatibilities with adopted plans and policies created by the approval of the proposed project.

Aesthetics

The Aesthetics chapter of the EIR will summarize existing regional and project area aesthetics and visual setting. The chapter will describe project specific aesthetic issues regarding buildout of the Sciortino Ranch project area such as scenic vistas, trees, historic buildings, scenic highways, and the existing visual character or quality of the site and the surrounding areas, as well as light and glare. This chapter will include an analysis of the existing setting, identification of the thresholds of significance, identification of impacts, and the development of mitigation measures and monitoring strategies. Included in the thresholds of significance will be whether the project would interrupt views of Mount Diablo. The chapter will focus on the Planned Development design guidelines, standards, and the policies related to aesthetic concerns (e.g., preservation of views of Mount Diablo, light and glare avoidance, and other aesthetic concerns).

Transportation and Circulation

The Transportation and Circulation chapter of the EIR will be based on a traffic study prepared for the Sciortino Ranch project. The traffic chapter will describe existing traffic conditions, existing plus project traffic conditions, cumulative no project conditions, and cumulative plus project conditions. The traffic chapter will summarize the existing and planned regional and local transportation network as well as existing and future traffic conditions. Traffic loads and capacity of street systems including level of service standards for critical street segments and intersections will be identified in this chapter. Emergency access, transit, pedestrian, and bicycle facilities will also be discussed and analyzed to ensure adequacy of the proposed facilities. In addition, the chapter will discuss the proposed internal circulation for the project, including signal and intersection recommendations. This chapter will include an analysis of the existing setting, identification of the thresholds of significance, identification of impacts, and the development of mitigation measures and monitoring strategies.

Air Quality and Climate Change

The Air Quality and Climate Change chapter of the EIR will summarize the regional air quality setting, including climate and topography, existing ambient air quality, regulatory setting, and presence of any sensitive receptors near the project or roads providing access to the project area. An analysis of regional changes in emissions due to vehicular travel from the project for an appropriate horizon year using the URBEMIS2007 computer program will be included. The level of significance of impacts identified in the analyses will be determined using the thresholds of significance recommended by the Bay Area Air Quality Management District, and mitigation measures and monitoring strategies will be recommended for all impacts identified to be significant. Increases in greenhouse gas (GHG) emissions (i.e., carbon dioxide, nitrous oxide,

and methane) attributable to the proposed project will also be quantified and included in the cumulative air quality impact discussion.

Noise

The Noise chapter of the EIR will include an analysis based on the existing setting, identification of thresholds of significance, identification of impacts, and the development of mitigation measures and monitoring strategies. The chapter will be based on a noise report prepared for the Sciortino Ranch project. Appropriate and practical recommendations for noise control, which are aimed at reducing any identified potential noise impacts to a level of insignificance, will be included in the chapter.

Biological Resources

The Biological Resources chapter of the EIR will describe the potential effects to plant communities, wildlife, and wetlands including adverse effects on rare, endangered, candidate, sensitive, and special-status species for the project area. The chapter will be based on a baseline biological resource inventory prepared for the Sciortino Ranch project. In addition, this chapter will include an analysis and discussion of the applicability of the Final East Contra Costa County HCP/NCCP to the project site, as well as identification of the thresholds of significance, identification of impacts, and mitigation measures and monitoring strategies aimed at reducing project impacts to a less-than-significant level.

Cultural Resources

The Cultural Resources chapter of the EIR will summarize the setting and describe the potential construction-related effects to cultural, historical, and archaeological resources. The chapter will be based on cultural resource studies prepared for the Sciortino Ranch project. The Cultural Resources chapter of the EIR will include an analysis of the existing setting, identification of the thresholds of significance, identification of impacts, and mitigation measures and monitoring strategies aimed at reducing project impacts to a less-than-significant level.

Hazards

The Hazards chapter of the EIR summarizes the setting and describes any potential for existing or possible hazardous materials to occur within the project area or as a result of the proposed Sciortino Ranch project, including pesticides and proximity to gas wells and petroleum pipelines. The Hazards chapter of the EIR will include an analysis of the existing setting, identification of the thresholds of significance, identification of impacts, and mitigation measures and monitoring strategies aimed at reducing project impacts to a less-than-significant level. The Phase I Environmental Site Assessment prepared for the site will be used in preparation of this chapter.

Public Services and Utilities

The Public Services and Utilities chapter of the EIR will summarize setting information and identify potential new demand for services on water supply, storm water drainage, sewage systems, solid waste disposal, telecommunications, roads, law enforcement, fire protection, schools, libraries, and parks and recreation. The chapter will include an analysis of the existing setting, description of proposed improvements, identification of the thresholds of significance, identification of impacts, and mitigation measures and monitoring strategies aimed at reducing project impacts to a less-than-significant level.

Statutorily Required Sections

The Statutorily Required Sections chapter of the EIR will evaluate potentially significant, unavoidable, significant irreversible, growth-inducing, and cumulative impacts. This chapter will summarize the cumulative impacts that will be contained in each technical chapter and will be qualitative in nature. In addition, the buildout of the Brentwood Boulevard Specific Plan will be included in the cumulative analysis of the proposed project.

Alternatives

The Alternatives chapter will evaluate, at a minimum, three alternatives. Alternatives will be selected when more information related to project impacts is available, but may include the no project alternative and two alternative land use scenarios feasible with new entitlements and zoning. The Alternatives chapter will describe the alternatives and identify the environmentally superior alternative. The alternatives will be analyzed at a level of detail less than that of the proposed project; however, the analyses will include sufficient detail to allow a comparison of the impacts.

SUBMITTING COMMENTS

To ensure that the full range of issues related to this proposed project is addressed and that all significant issues are identified, written comments are invited from all interested parties. Written comments concerning the scope of the proposed CEQA analysis for the Sciortino Ranch project should be directed to the name and address below:

Mr. Erik Nolthenius, Principal Planner
City of Brentwood Community Development Department
104 Oak Street
Brentwood, CA 94513
(925) 516-5137
Fax (925) 516-5407

Written comments are due to the City of Brentwood at the location addressed above by 5:00 p.m. on December 9, 2008.

APPENDIX B

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 622-5491
FAX (510) 286-5559
TTY 711

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November 17, 2008

CC004020
CC-4-38.063
SCH#2008112041

Mr. Erik Nolthenius
City of Brentwood
104 Oak Street
Brentwood, CA 94804

Dear Mr. Nolthenius:

Sciortino Ranch – Notice of Preparation (NOP)

Thank you for including the California Department of Transportation (Department) in the environmental review process for the Sciortino Ranch project. We have reviewed the proposed NOP and have the following comments to offer.

As lead agency, the City of Brentwood is responsible for all project mitigation, including any needed improvements to State highways. The project's fair share contribution, financing, scheduling, and implementation responsibilities as well as lead agency monitoring should be fully discussed for all proposed mitigation measures and the project's traffic mitigation fees should be specifically identified in the NOP.

Any required roadway improvements should be completed prior to issuance of project occupancy permits. An encroachment permit is required when the project involves work in the State's right of way (ROW). The Department will not issue an encroachment permit until our concerns are adequately addressed. Therefore, we strongly recommend that the lead agency ensure resolution of the Department's CEQA concerns prior to submittal of the encroachment permit application; see the end of this letter for more information regarding the encroachment permit process.

Traffic Impact Study (TIS)
The Department is primarily concerned with impacts to the State Highway System. Specifically, a detailed Traffic Impact Study (TIS) should identify impacts to the State Highway System. The TIS should include, but is not limited to the following:

1. Information on the project's traffic impacts in terms of trip generation, distribution, and assignment. The assumptions and methodologies used in compiling this information should be addressed.

2. Average Daily Traffic (ADT) and AM and PM peak hour volumes on all significantly affected streets and highways, including crossroads and controlling intersections.

3. Schematic illustration of the traffic conditions for: 1) existing, 2) existing plus project, and 3) cumulative for the intersections in the project area.

4. Calculation of cumulative traffic volumes should consider all traffic-generating developments, both existing and future, that would affect the State Highway facilities being evaluated.

5. Mitigation measures should consider highway and non-highway improvements and services. Special attention should be given to the development of alternate solutions to circulation problems that do not rely on increased highway construction.

6. All mitigation measures proposed should be fully discussed, including financing, scheduling, implementation responsibilities, and lead agency monitoring.

We encourage the City of Brentwood to coordinate preparation of the study with our office, and we would appreciate the opportunity to review the scope of work. Please see the Caltrans' *"Guide for the Preparation of Traffic Impact Studies"* at the following website for more information:
http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

We look forward to reviewing the TIS, including Technical Appendices, and environmental document for this project. Please send two copies to the address at the top of this letterhead, marked ATTN: Luis Melendez, Mail Stop #10D.

Community Planning
The Department encourages you to locate any needed housing, jobs and neighborhood services near major mass transit nodes, and connected to these nodes with streets configured to encourage walking and biking, as a means of reducing regional vehicle miles traveled and traffic impacts on the state highways.

In addition, consider developing and applying pedestrian, bicycling and transit performance measures or level of service mitigation measures and modeling pedestrian, bicycle and transit trips that your project will generate so that impacts can be quantified. Mitigation measures resulting from this analysis could improve pedestrian and bicycle access to transit, thereby reducing traffic impacts on state highways. In addition, please analyze secondary impacts on pedestrians and bicyclists that may result from any mitigation measures for traffic impacts and describe any pedestrian and bicycle mitigation measures

that would in turn be needed as a means of maintaining and improving access to transit and reducing traffic impacts on state highways.

Cultural Resources
If construction activities are proposed within the State's ROW, the Department requires documented results of a current archaeological record search from the Northwest Information Center (NIC) of the California Historical Resources Information System before an encroachment permit can be issued. Current record searches must be no more than five years old.

The Department requires the records search, and if warranted, a cultural resource study by a qualified, professional archaeologist, to ensure compliance with NEPA (if there is federal action on the project), CEQA, Section 5024.5 of the California Public Resources Code (for state-owned historic resources) and Volume 2 of the Department's Environmental Handbook (Caltrans Standard Environmental Reference (SER), available at http://www.dot.ca.gov/hq/env/index.htm). Work subject to these requirements includes, but is not limited to: lane widening, channelization, auxiliary lanes, and/or modification of existing features such as slopes, drainage features, curbs, sidewalks and driveways within or adjacent to State ROW.

Encroachment Permit
Any work or traffic control within the State ROW requires an encroachment permit that is issued by the Department. Traffic-related mitigation measures will be incorporated into the construction plans during the encroachment permit process. See the following website link for more information: http://www.dot.ca.gov/hq/traffops/developserv/permits/

To apply for an encroachment permit, submit a completed encroachment permit application, environmental documentation, and five (5) sets of plans which clearly indicate State ROW to the address at the top of this letterhead, marked ATTN: Michael Condie, Mail Stop #5E.

Should you have any questions regarding this letter, please contact Luis Melendez of my staff at (510) 286-5606 or via email at luis.melendez@dot.ca.gov.

Sincerely,

Lisa Carboni

LISA CARBONI
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

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Jack P. Broadbent
EXECUTIVE OFFICER/APCO

December 9, 2008

Erik Nolthenius
City of Brentwood
104 Oak Street
Brentwood, CA 94513-1396

Subject: Notice of Preparation of a Draft Environmental Impact Report for Sciortino Ranch

Dear Mr. Nolthenius:

Bay Area Air Quality Management District (District) staff reviewed the Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Sciortino Ranch Project (Project). We understand that the Project will result in the development of up to 468 multi-family apartments, 140 single-family detached homes, 107,267 square feet of mixed retail, office, and commercial uses, 228,690 square feet of institutional uses, and 5.1 acres of parks. Implementation of the project will require an amendment to the City of Brentwood's General Plan and zoning ordinance.

The District has the following specific comments on the environmental analysis that should be included in the EIR.

1. The EIR should provide background information regarding the District's attainment status for all criteria pollutants and the implications for the region if these standards are not attained by statutory deadlines. Information should also be included on the implementation status of the U.S. Environmental Protection Agency's (EPA) recently adopted, more protective $PM_{2.5}$ and ozone standards. A discussion of the health effects of air pollution, especially on sensitive receptors, should be provided.

2. The *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999)* provide guidance on how to evaluate a project's construction, operational and cumulative air quality impacts. You may download a copy from the District's web site at: http://www.baaqmd.gov/pln/ceqa/index.htm. The EIR should provide a detailed analysis of the Project's potential effects on local and regional air quality from construction, operations and cumulative impacts for the Project and each of the alternatives analyzed. Implementation of the Project requires a General Plan Amendment; the EIR should estimate emissions associated with the existing land uses versus proposed land uses. The EIR should estimate daily and annual volatile organic compounds (VOCs), nitrogen oxides (NOx), and particulate matter (PM_{10}) emissions from stationary, area and mobile sources resulting from long-term project operation. These estimates should be compared to the significance thresholds in the *BAAQMD CEQA Guidelines*. We recommend utilizing URBEMIS 2007, version 9.2.4, for estimating emissions.

3. The EIR should estimate and evaluate the potential health risk to current and future sensitive populations within the Project area from toxic air contaminants (TACs) as a result of Project construction and operation. We recommend you refer to California Air Resources Board's (ARB) *Air Quality and Land Use Handbook: a Community Health Perspective,* (http://www.arb.ca.gov/ch/landuse.htm) for guidelines on siting sensitive land uses. We recommend that the EIR evaluate any risks with siting these land uses near major transportation corridors and other sources of TACs. In particular, we note that the Project is sited in proximity to State Route 4 and a rail line. We recommend that the DEIR analyze the potential impacts of exhaust emissions associated with these corridors on sensitive receptors. The DEIR should also disclose if the Project encompasses or is close to any natural gas wells or natural gas processing facilities and identify any significant adverse impacts or risks associated with development proposed near these facilities.

4. Construction equipment generates fugitive dust emissions, exhaust emissions of criteria pollutants, and TACs, specifically diesel particulate matter (DPM), a known carcinogen. The EIR should require that all construction activities associated with the Project comply with the dust mitigation measures in the District's CEQA guidelines. The EIR should also include all feasible mitigation measures to reduce construction equipment exhaust emissions to reduce potentially significant exposure to TAC for the existing community. Such measures could include but are not limited to: maintaining properly tuned engines; minimizing the idling time of diesel powered construction equipment to two minutes; using alternative powered construction equipment (i.e., CNG, biodiesel, electric); using add-on control devices such as diesel oxidation catalysts or particulate filters; using equipment that meets ARB's most recent certification standard for off-road heavy duty diesel engines; phasing project construction; and limiting the operating hours of heavy duty equipment.

5. The EIR should evaluate the Project's potential to increase the demand for energy. Increased demand for electricity, natural gas, and gasoline may result in an increase of criteria air pollutant emissions from combustion, as well as an increase in greenhouse gas emissions. We recommend that the EIR discuss energy demand of the Project at build-out, including any cumulative impacts, such as the need to build peaker power plants to provide power during peak demand. When identifying strategies to minimize the Project's impact on energy and air quality, the EIR should include feasible mitigation measures that require a minimum level of green building measures for new development. This minimum level could be based on the Leadership in Energy and Environmental Design (LEED) standards or by setting a target percentage reduction below California Building Code's Title 24 energy standards. Green building measures could include but are not limited to using: super-efficient heating, ventilation, and air conditioning (HVAC) systems; light-colored and reflective roofing materials, pavement treatments and other energy efficient building materials; shade trees adjacent to buildings and in parking areas; photovoltaic panels on buildings; and natural and energy-efficient lighting.

6. In accordance with the technical advisory issued by the Governor's Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality (CEQA) Act Review,* we recommend that the EIR analyze greenhouse gas (GHG) emissions associated with implementation of the Project. The California Air

Pollution Control Officers Association (CAPCOA) recently released a resource document addressing GHG emissions from projects subject to CEQA. The resource document, *CEQA and Climate Change*, contains an overview of available tools and models for evaluating GHG emissions and strategies for mitigating potentially significant GHG emissions from projects. The report may be downloaded at http://www.capcoa.org. The Project should seek to minimize its contribution to climate change by implementing all feasible mitigation measures to reduce GHG emissions, especially those measures targeting the Project's vehicle miles traveled, as transportation represents approximately 50 percent of the Bay Area's GHG emissions.

If you have any questions regarding these comments, please contact Nadine Wilmot, Environmental Planner, at (415) 749-5074.

Sincerely,

Jean Roggenkamp

Jean Roggenkamp
Deputy Air Pollution Control Officer

cc: BAAQMD Director John Gioia
BAAQMD Director Mark Ross
BAAQMD Director Michael Shimansky
BAAQMD Director Gayle B. Uilkema

Department of Conservation & Development

County Administration Building
651 Pine Street
North Wing, Fourth Floor
Martinez, CA 94553-1229

Phone:

(925) 335-1220

Contra Costa County

Catherine O. Kutsuris
Director

James Kennedy
Deputy Director
Redevelopment Division

Thomas J. Huggett, SE
Interim Deputy Director
Building Inspection Division

RECEIVED
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CITY OF BRENTWOOD
COMMUNITY DEVELOPMENT DEPT.

December 9, 2008

Lead Agency: City of Brentwood
Attn: Erik Nolthenius
104 Oak Street
Brentwood, CA 94513

RE: Notice of Preparation for "Sciortino Ranch" Development Project.
City of Brentwood

Dear Mr. Nolthenius:

Thank you for providing the Department of Conservation and Development, Contra Costa County an opportunity to comment on the above captioned project. The Transportation Planning Section would like to provide the following comments on the proposed project:

- The City of Brentwood should put in to use the *East County Action Plan for Routes of Regional Significance* Traffic Service Objectives as the thresholds of significance for traffic congestion impacts.

- The Contra Costa Transportation Authority's *Technical Procedures* manual provides guidance for the evaluation of transportation impacts. The EIR should use the *Technical Procedures* for the evaluation of traffic congestion. The EIR should determine if any intersections on rural roads may be impacted by the proposed project, and if those intersections would require signalization or other methods to accommodate the traffic demand generated by the project.

- The Contra Costa Transportation Authority has specification, policies, and procedures for its travel demand forecasting model. The EIR should use the Authority's model and discuss with County staff regarding any adjustments to the model proposed by the City when determining the project's transportation impacts.

- The EIR should evaluate the impact of additional traffic on rural roads (e.g. Sellers Avenue, Sunset Road and Lone Tree Way). The area east of the project site is served by unincorporated area roads that have narrow lanes and little or no shoulders. This road configuration can accommodate rural land uses but has limited ability to serve commuter-

oriented traffic. The EIR should focus on the cumulative near-term, as well as the cumulative impacts associated with the *Brentwood Boulevard Specific Plan* program on rural roads in the vicinity of the project site.

In reference to the above captioned project, the Department of Conservation and Development, Contra Costa County not a responsible agency.

If you have any questions or concerns regarding the above comments, please do not hesitate to contact me at (925) 335-1220, or e-mail me at jstam@cd.cccounty.us. Again, thank you for the opportunity to respond to the Notice of Preparation. The County looks forward to being involved in the review of subsequent environmental documents for the proposed project.

Sincerely,

Jamar Stamps, Planner
Transportation Planning Section

cc: S. Goetz, DCD
P. Roche, DCD
M. Halle, PWD
C. Standafer, PWD

G:\Transportation\EIRs\Brentwood\Sciortino Ranch_City of Brentwood comments.doc

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

December 8, 2008

Erik Nolthenius
City of Brentwood
104 Oak Street
Brentwood, CA 94513-1396

Re: Notice of Preparation (NOP), Draft Environmental Impact Report (EIR)
SCH #2008112041, Sciortino Ranch

Dear Mr. Nolthenius:

As the state agency responsible for rail safety within California, the California Public Utilities Commission (CPUC or Commission) recommends that development projects proposed near rail corridors be planned with the safety of these corridors in mind. New developments and improvements to existing facilities may increase vehicular traffic volumes, not only on streets and at intersections, but also at at-grade highway-rail crossings. In addition, projects may increase pedestrian traffic at crossings, and elsewhere along rail corridor rights-of-way. Working with CPUC staff early in project planning will help project proponents, agency staff, and other reviewers to identify potential project impacts and appropriate mitigation measures, and thereby improve the safety of motorists, pedestrians, railroad personnel, and railroad passengers.

The following at-grade rail crossings; Central Boulevard (CPUC # 001B-61.60) and Lone Tree Way (CPUC # 001B-59.10) need to be included in the Traffic Impact Study (T.I.S) of the DEIR.

The Central Boulevard crossing is older, however it is built with medians and median mounted gates. The only issue with this crossing is that the median mounted gates do not meet clearances. They are currently only 4 feet to the face of curb and MUTCD requires 4’3’’ to face of curb. The medians are wide enough, but the median mounted gates need to be relocated more towards the center of the medians and would require longer gates to cover the roadway due to the relocation. Another option is to widen the median to allow for the proper clearance. This option would make the travel lanes narrower.

The Lone Tree Way crossing is a significantly traveled roadway that connects Brentwood to SR 4 bypass. This crossing is supposed to be grade separated as part of the Sand Creek Road new crossing application (A.02-03-003/D.02-09-016). However, there are some outstanding issues between the City and Union Pacific regarding the grade separation and the lack of funding for construction. The crossing needs to be grade separated due to the high Average daily trips (ADT) at this location.

This Line (Mococo) has not been used in over 20 years. However, Union Pacific is planning to resume service along this line and needs to be included in the traffic impact study.

The Commission recommends that the City include potential project-related rail safety impacts and measures to reduce adverse impacts of the proposed project. The project's traffic impact study (TIS) is the mechanism by which to address these concerns since it will be the basis for the analysis within the Traffic/Circulation section of the DEIR.

In general, the major types of impacts to consider are collisions between trains and vehicles, and between trains and pedestrians. Changes in land use should not be allowed that would permit housing adjacent to existing rail yards. Similarly, where a need for grade-separated crossings is identified, new development should not be placed adjacent to at-grade highway rail crossings, within the footprint of land needed for future grade-separation structures.

General categories of measures to reduce potential adverse impacts on rail safety include:

- Installation of grade separations at crossings, i.e., physically separating roads and railroad track by constructing overpasses or *underpasses*
- Improvements to warning devices at existing highway-rail crossings
- Installation of additional warning signage
- Improvements to traffic signaling at intersections adjacent to crossings, e.g., traffic preemption
- Installation of median separation to prevent vehicles from driving around railroad crossing gates
- Where soundwalls, landscaping, buildings, etc. would be installed near crossings, maintaining the visibility of warning devices and approaching trains
- Prohibition of parking within 100 feet of crossings to improve the visibility of warning devices and approaching trains
- Installation of pedestrian-specific warning devices and channelization
- Installation of additional traffic lanes through the crossing to accommodate additional traffic
- Construction of pull-out lanes for buses and vehicles transporting hazardous materials
- Installation of vandal-resistant fencing or walls to limit the access of pedestrians onto the railroad right-of-way
- Elimination of driveways near crossings
- Increased enforcement of traffic laws at crossings
- Rail safety awareness programs to educate the public about the hazards of highway-rail grade crossings

CPUC also encourages localities to set up mechanisms whereby new developments pay a fair share of their impact costs to fund the above measures if not already in an existing Fee program by the City or a Regional Fee program.

Erik Nolthenius
City of Brentwood

The proposed project vehicle trips will have direct and cumulative impacts that may require mitigation measures by the project proponent as a result of this analysis. The mitigation monitoring section of the DEIR needs to include the results of the traffic analysis impacts, proposed mitigation measures, responsible agency and a completion date of improvements. The Commission could be a responsible agency under CEQA section 15381 with the review of this project and needs to be referenced accordingly in the environmental documents depending on the impacts to the rail corridor and at grade rail crossings referenced.

Please forward the TIS scope, so we may have an opportunity to review the proposed analysis which will make our review more efficient and expedient for the project proponent. Should you have a planned scoping meeting for the traffic study, we would like to be notified along with other agencies affected or impacted by the proposed project.

Thank you for your consideration of these comments and we look forward to working with the City on this project. If you have any questions in this matter, please call me at (415) 713-0092 or email @ ms2@cpuc.ca.gov.
.

Sincerely,

Moses Stites
Rail Corridor Safety Specialist
Consumer Protection and Safety Division
Rail Transit and Crossings Branch
515 L Street, Suite 1119
Sacramento, CA 95814

APPENDIX C

CITY OF BRENTWOOD
COMMUNITY DEVELOPMENT DEPARTMENT

Sciortino Ranch

INITIAL STUDY

December 2008

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INITIAL STUDY

DECEMBER 2008

A. BACKGROUND

1. Project Title: Sciortino Ranch

2. Lead Agency Name and Address: City of Brentwood
Community Development Department
118 Oak Street
Brentwood, CA 94513

3. Contact Person and Phone Number: Erik Nolthenius
Principal Planner
(925) 516-5137

4. Project Location: Intersection of Sand Creek Road and Brentwood Boulevard (State Route 4)
City of Brentwood
Contra Costa County

5. Project Sponsor's Name and Address: New Urban Communities/Sciortino LLC
333 Civic Drive
Pleasant Hill, CA 94523

6. Existing General Plan Designations: Mixed-Use Business Park (BP)
Very High Density Residential (VHDR)

7. Proposed General Plan Designations: Amendment to the Special Planning Area (SPA-A)

8. Existing Zoning Designations: Planned Development (PD)-55

9. Proposed Zoning Designations: Amendment to the Planned Development (PD)-55

10. Surrounding General Plan Designations: General Commercial (GC)
Medium Density residential (MDR)
Low Density Residential (LDR)

11. Project Description Summary:

The proposed Sciortino Ranch project site is located within the eastern portion of the City of Brentwood in Contra Costa County, California. The project site is located at the intersection of Sand Creek Road and Brentwood Boulevard (State Route 4). The project

site consists of approximately 65 acres, with a total of three lots identified by Assessor's Parcel Numbers 016-170-011, -012, and -013.

The proposed project includes the following requested entitlements:

- Certification of an EIR;
- Approval of a General Plan Amendment;
- Approval of an amendment to the PD-55 zone inclusive of a Sub-Area Map, Zoning Matrix, and associated Design Guidelines; and
- Approval of a Vesting Tentative Subdivision Map to subdivide the site into 11 parcels.

B. SOURCES

The following documents are referenced information sources utilized by this analysis:

1. California Department of Conservation, Farmland Mapping and Monitoring Program. Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance, Contra Costa County. 1995 (updated 2004);
2. City of Brentwood. General Plan 1993-2001. June 1993;
3. City of Brentwood. General Plan (2001-2021). November 2001;
4. City of Brentwood. General Plan Update EIR. November 2001;
5. City of Brentwood. Zoning Ordinance. 2009;
6. Flood Insurance Rate Map, City of Brentwood, California, Contra Costa County, Community Panel Number 0600250355C; and
7. USDA Soil Conservation Service. Contra Costa County Soil Survey. 1973.

C. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is "Potentially Significant" as indicated by the checklist on the following pages.

✖ **Aesthetics**	☐ **Agriculture Resources**	✖ **Air Quality & Climate Change**
✖ **Biological Resources**	✖ **Cultural Resources**	✖ **Geology & Soils**
✖ **Hazards**	☐ **Hydrology & Water Quality**	✖ **Land Use**
☐ **Mineral Resources**	✖ **Noise**	✖ **Population, Employment, & Housing**
✖ **Public Services**	✖ **Recreation**	✖ **Transportation & Circulation**
✖ **Utilities & Service Systems**	✖ **Mandatory Findings of Significance**	

D. DETERMINATION

On the basis of this initial study:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the applicant. A MITIGATED NEGATIVE DECLARATION will be prepared.

✖ I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Mr. Erik Nolthenius	City of Brentwood
Printed Name	For

E. BACKGROUND AND INTRODUCTION

This Initial Study identifies and analyzes the potential environmental impacts of the Sciortino Ranch project (proposed project). The information and analysis presented in this document is organized in accordance with the order of the California Environmental Quality Act (CEQA) checklist in Appendix G of the CEQA Guidelines. If the analysis provided in this document identifies potentially significant environmental effects of the project, mitigation measures that should be applied to the project are prescribed, or further analysis is deferred to the EIR.

The mitigation measures prescribed for environmental effects described in this Initial Study will be implemented in conjunction with the project, as required by CEQA. The mitigation measures will be incorporated into the project through project conditions of approval. The City will adopt findings and a Mitigation Monitoring/Reporting Program for the project in conjunction with approval of the project.

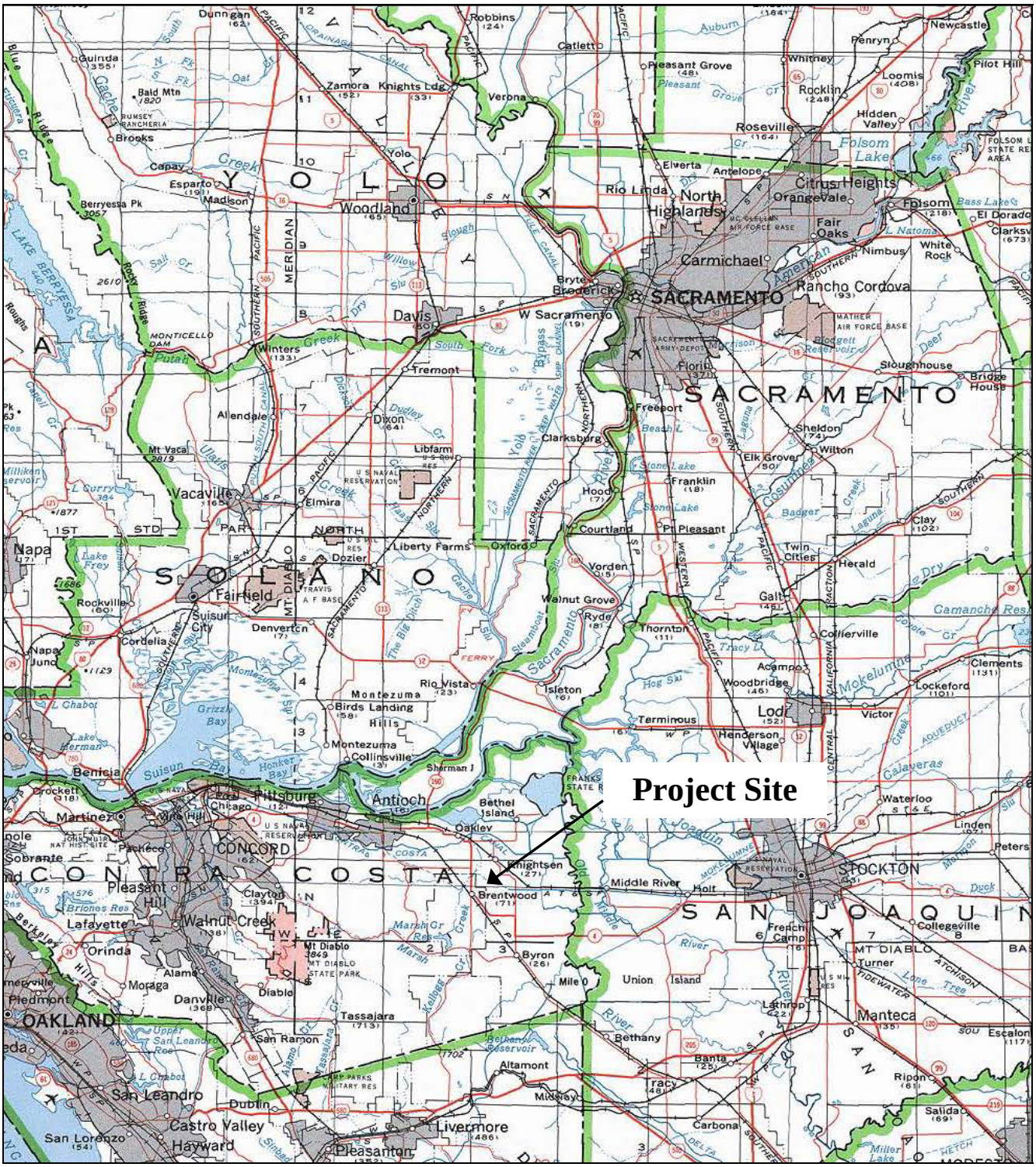
In 2001, the City of Brentwood completed a General Plan Update, which updated the Land Use, Growth Management, and Circulation Elements of the 1993 General Plan. An EIR was prepared for the General Plan Update, which addressed the potential impacts of the proposed updates. The General Plan Update EIR was a program EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations, Sections 15000 *et seq*.). The Brentwood General Plan Update EIR analyzed full implementation of the Brentwood General Plan Update and identified measures to mitigate the significant adverse project and cumulative impacts associated with the General Plan. Because the General Plan Update only addresses three elements of the General Plan, the remaining elements are addressed in the 1993 General Plan. The 1993 General Plan adoption also included certification of a Program EIR addressing full implementation of the Plan.

The environmental setting and impact discussion for each section of this Initial Study have been largely based on information in the *City of Brentwood 1993 General Plan*, the *City of Brentwood General Plan Update*, and the *City of Brentwood General Plan Update EIR*. In addition, a series of detailed technical reports, prepared specifically for the Sciortino Ranch project by subconsultants, are utilized where appropriate.

F. PROJECT DESCRIPTION

The proposed project is located within the northeastern portion of the City of Brentwood. The City of Brentwood is located in the eastern valley area of Contra Costa County immediately east of the Diablo Range, on the western edge of the San Joaquin Valley (See Figure 1, Regional Location Map). The City has historically been surrounded by agricultural land uses consisting primarily of row crops, orchards, and grazing lands. The City's planning area is located southeast of Antioch and south of the City of Oakley and Bethel Island. The planning area consists of approximately 65 square miles, and is characterized by the relatively flat terrain of the Central Valley, with gently sloping hills in the western and southwestern portion of the area approaching the foothills of the Diablo Range. The tree-studded slopes and grassy rolling hills of the eastern portion of the Diablo Range, comprise the surrounding visual character of Brentwood. Rising to an elevation of 3,849 feet above mean sea level (msl), Mount Diablo is the main visual feature outside the Brentwood planning area, and is a prominent landmark dominating the western skyline.

Figure 1
Regional Location Map


Project Site
SACRAMENTO
YOLO
SOLANO
CONTRA COSTA
SAN JOAQUIN
Woodland
Davis
Winters
Vacaville
Fairfield
Napa
Benicia
Martinez
Pittsburg
Antioch
CONCORD
Walnut Creek
Pleasant Hill
Lafayette
Orinda
Moraga
Danville
OAKLAND
San Leandro
Hayward
Castro Valley
San Lorenzo
Pleasanton
Livermore
Dublin
Brentwood
Knightsen
Oakley
Rio Vista
Isleton
Clarksburg
Elk Grove
Galt
Lodi
Stockton
Manteca
Tracy
Ripon
Folsom
Roseville
Rocklin
Loomis
Citrus Heights
Carmichael
Rancho Cordova
Fair Oaks
Orangevale
Rio Linda
North Highlands
Elverta
Antelope
Florin
Freeport
Sloughhouse
Wilton
Courtland
Walnut Grove
Thornton
Collierville
Acampo
Woodbridge
Clements
Lockeford
Victor
Terminous
Henderson Village
Bethel Island
Byron
Bethany
Altamont
Mountain House
Carbona
Salida
Escalon
Lathrop
Mile 0
Union Island
Middle River
Holt
French Camp
Collegeville
Linden
Waterloo
Peters
Turner
Montezuma
Birds Landing
Collinsville
Sherman I
Hills
Liberty Farms
Dozier
Elmira
Allendale
Dixon
Tremont
Libfarm
Mt Vaca
Rockville
Suisun City
Cordelia
Denverton
Vorden
Ryde
Hood
Franklin
Pt Pleasant
Twin Cities
Herald
Clay
Oxford
Zamora
Knights Ldg
Verona
Dunnigan
Robbins
Catlett
Pleasant Grove
Whitney
Newcastle
Penryn
Pilot Hill
Hidden Valley
Folsom Lake
Bass Lake
El Dorado
Clarksv
White Rock
Nimbus
Bryte
Broderick
W Sacramento
Guinda
Brooks
Capay
Esparto
Madison
Berryessa Pk
Bald Mtn
Rumsey Rancheria
Mt Vaca
Mt Diablo
Clayton
Alamo
Piedmont
Pacheco
Sobrante
Briones Res
Tassajara
San Ramon
Byron
Tracy
Banta
Lathrop
Manteca
Ripon
Salida
Escalon
Stockton
Lake Berryessa
Lake Frey
Lake Herman
Grizzly Bay
Suisun Bay
Honker Bay
Sacramento River
Yolo Bypass
Folsom Lake
Stone Lake
Clifton Court Forebay
Bethany Reservoir
Camanche Res
Calaveras
Mokelumne
Cosumnes
Sacramento
Yolo
Putah
Cache Creek
Dry Creek
Willow Slough
Salt Cr
Rocky Ridge
Roughs
Blue Ridge
Milliken Reservoir
Capell Cr
Curry
Chabot
Upper San Leandro Res
Lake Merritt
Sinbad
Miller Lake
Hetch Hetch Aqueduct
Mt Diablo State Park
Mather Air Force Base
Sacramento Army Depot
Travis A F Base
Rumsey Rancheria
Folsom State Recreation Area
Bridge House
Bridge Deer Creek
Dry Creek
Cosumnes River
Mokelumne River
Calaveras River
Tidewater Lone Tree
Atchison
Southern Pacific
Western Pacific
Central California Traction
Aqueduct
Hog Slu
Tracy L
Stone Lake
Beach L
Badger Creek
Laguna Creek
Dry Creek
Deer Creek
Morrison Slough
Dudley Cr
Dixon Slough
Willow Slough
Salt Cr
Rocky Ridge
Roughs
Blue Ridge
Cache Creek
Putah Creek
Sacramento River
Yolo Bypass
Sacramento Bypass
Sacramento Deep Water Ship Channel
Sacramento Drainage Canal
Yolo Bypass Drainage Canal
Sacramento Weir
Fremont Weir
Knights Landing Ship Channel
Sacramento Canal
Yolo Canal
Sacramento Slough
Steamboat Slu
Sacramento Slough

The proposed project site is within the North Brentwood Redevelopment Area, Special Planning Area (SPA-A) of the General Plan, and also within the limits of the proposed Brentwood Boulevard Specific Plan (BBSP) area, for which a draft specific plan policy document has been prepared and is currently under review by the City. The project site is located at the intersection of Sand Creek Road and Brentwood Boulevard (State Route 4) and is approximately 65 acres. The project site consists of two legal parcels, identified by Assessor's Parcel Numbers (APNs) 016-170-012 and -013 (See Figure 2, Project Location Map). The proposed project site is surrounded by residential development to the north, east and south with commercial to the west.

The project site primarily consists of disked vacant land, which was historically used for agriculture. A natural gas well and irrigation well exist in the northeastern portion of the site. In addition, evidence of a former agricultural residence, associated buildings, and an inactive water well is located near the western boundary of the site.

The City of Brentwood General Plan land use designations for the project site include Mixed-Use Business Park (BP) and Very High Density Residential (VHDR). The surrounding General Plan land use designations include General Commercial (GC), Medium Density Residential (MDR), and Low Density Residential (LDR). The current zoning designation for the project site is Planned Development (PD)-55. For land uses surrounding the project site, refer to the Project Description chapter of the EIR for a complete project description.

The following environmental checklist is based on the form presented in Appendix G of the CEQA Guidelines. The checklist form is used to describe the impacts of the proposed project. A discussion follows each environmental issue identified in the checklist when appropriate project-specific mitigation measures are recommended as part of the proposed project.

G. ENVIRONMENTAL CHECKLIST

For this checklist, the following designations are used:

Potentially Significant Impact: An impact that could be significant, and for which no mitigation has been identified. If any potentially significant impacts are identified, an EIR must be prepared.

Potentially Significant Unless Mitigation Incorporated: An impact that requires mitigation to reduce the impact to a less-than-significant level.

Less-Than-Significant Impact: Any impact that would not be considered significant under CEQA relative to existing standards.

No Impact: The project would not have any impact.

Figure 2
Project Location Map

I. AESTHETICS. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	✖	☐	☐	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	✖	☐	☐	☐
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	✖	☐	☐	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	✖	☐	☐	☐

Discussion

a,b. The proposed project is not within an area designated as a scenic vista. However, the project site is relatively flat and the City has distinctive views of Mount Diablo. The General Plan recognizes views of Mount Diablo as an important visual resource that can be seen from almost anywhere in the City of Brentwood. In addition, State Route 4 (SR 4), which the General Plan Update EIR designates as a scenic route, runs north to south adjacent to the western border of the project site. Future construction on the project site could affect views of Mount Diablo and one scenic route; therefore, a ***potentially significant*** impact to scenic resources would occur.

Further analysis of this impact is included in the Aesthetics Chapter of the Sciortino Ranch Draft EIR.

c. The proposed project site's existing visual character and quality of the site will be affected by construction activities once development begins. The site is currently vacant; therefore, the proposed project would change the existing character of the area resulting in a ***potentially significant*** impact.

Further analysis of this impact is included in the Aesthetics Chapter of the Sciortino Ranch Draft EIR.

d. Currently, the project site is characterized by fallow farmland and is predominantly vacant. The project site was previously used for intensive agricultural production. The proposed project would create new sources of light and glare, which could adversely affect daytime or nighttime views in the area. Therefore, the project would have a ***potentially significant*** impact in regard to creation of new sources of light and glare.

Further analysis of this impact is included in the Aesthetics Chapter of the Sciortino Ranch Draft EIR.

II. AGRICULTURAL RESOURCES. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping Program of the California Resources Agency, to non-agricultural use?	☐	✖	☐	☐
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	✖
c. Involve other changes in the existing environment which, due to their location or nature, could individually or cumulatively result in loss of Farmland to non-agricultural use?	☐	✖	☐	☐

Discussion

a,c. The General Plan designates areas along portions of the Brentwood Planning Area for Agriculture Conservation (See Figure 2-3 of the General Plan Update EIR). The project site is not located within the areas designated for Agriculture Conservation. However, according to the *Soil Survey for Contra Costa County*, the majority of the project site is made up of Brentwood clay loam (Bb), and Capay clay (CaA). The California Department of Conservation Farmland Mapping and Monitoring Program *Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance, Contra Costa County*, lists Bb, and CaA, as being soils meeting the criteria for Prime Farmland.

According to the General Plan Update EIR, buildout of the General Plan area would result in urban development of prime agricultural lands, which is considered a significant impact. The General Plan Update EIR included mitigation measures to reduce impacts to prime agricultural lands; however the impact to agricultural resources was found to be significant and unavoidable. The Brentwood City Council adopted Findings of Fact and a Statement of Overriding Considerations for the significant and unavoidable impacts associated with the General Plan buildout.

It should be noted, however, pursuant to the Brentwood Municipal Code, Section 17.730.030, the City requires mitigation by any applicant for a subdivision that will permanently change agricultural land over one acre in size to any nonagricultural use. This program requires the applicant to either grant a farmland conservation easement or farmland deed restriction to the City and/or a "qualifying entity" approved by the City, on a one-to-one land area ratio, or pay an in-lieu fee based on a formula for a one-to-one land area ratio and established by City Council resolution. Should the proposed project not comply with Section 17.730.030 of the Brentwood Municipal Code, a ***potentially significant*** impact to agricultural land would result.

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

II-1. *Prior to the issuance of a grading permit, the project applicant shall either grant a farmland conservation easement or farmland deed restriction to the City of Brentwood (and/or a "qualifying entity" approved by the City) on a one-to-one land area ratio, or pay an in-lieu fee based on a formula for a one-to-one land area ratio, which shall be established by City Council resolution.*

b. The project site is not under any Williamson Act contract and the area is designated for urban uses. In addition, none of the parcels within the proposed project area are designated for agricultural use. Therefore, because buildout of the project site would not conflict with a Williamson Act contract or existing zoning for agriculture, the proposed project would result in ***no impact***.

III. AIR QUALITY. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	✖	☐	☐	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	✖	☐	☐	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	✖	☐	☐	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	✖	☐	☐	☐
e. Create objectionable odors affecting a substantial number of people?	✖	☐	☐	☐

Discussion

a-d. The City of Brentwood is part of the San Francisco Bay Area airshed, which is dominated by the strength and position of a semi-permanent, high-pressure center over the Pacific Ocean. The area is exposed to winds from both the east and west, and the terrain provides little protection from the wind. Air quality within the region is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD periodically prepares and updates plans to achieve the goal of healthy air. In addition, the BAAQMD establishes thresholds for pollutants that, if exceeded, would constitute a significant impact. The Bay Area Air Basin is considered nonattainment-unclassified for the national 1-hour ozone standard, and is either unclassified or attainment for other pollutants of concern.

The development of the proposed project site would result in increased vehicle trips in the City of Brentwood, which would generate increased amounts of ozone precursors (NO_X and ROG) and carbon monoxide (CO) that could exceed BAAQMD thresholds and conflict with applicable air quality plans. In addition, construction-related activities within the project site would involve grading and excavation activities that would generate particulate matter (PM_{10}), which could also exceed BAAQMD thresholds.

The project area consists of mixed commercial and residential uses. Sensitive receptors in the vicinity of the project area consist of a variety of urban uses. Future development of the proposed project site would replace current vacant land with urban uses. Therefore, implementation of the proposed project would result in a ***potentially significant*** impact to air quality.

Further analysis of this impact is included in the Air Quality Chapter of the Sciortino Ranch Draft EIR.

e. The proposed project has the potential to create odors, which could impact potential sensitive receptors. Therefore, the proposed project would have a ***potentially significant*** impact related to the creation of objectionable odors.

Further analysis of this impact is included in the Air Quality Chapter of the Sciortino Ranch Draft EIR.

IV. BIOLOGICAL RESOURCES. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	✖	☐	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	✖	☐	☐	☐
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	✖	☐	☐	☐
d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	✖	☐	☐	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	✖	☐	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	✖	☐	☐	☐

Discussion

a,b,d. The proposed project site was previously used for intensive agricultural production. Buildout of vacant land on the project site would result in the conversion of undeveloped land to urban uses and could have adverse impacts to special-status wildlife species and sensitive natural communities. As development on the project site has the potential to adversely impact special-status wildlife species and natural communities a ***potentially significant*** impact would occur related to the disturbance of any biological resources.

Further analysis of this impact is included in the Biological Resources Chapter of the Sciortino Ranch Draft EIR.

c. The proposed project site could contain wetlands or riparian habitat, which would have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act. Therefore, a ***potentially significant impact*** would occur.

Further analysis of this impact is included in the Biological Resources Chapter of the Sciortino Ranch Draft EIR.

e. Development on the project site could result in the damage or removal of on-site trees; therefore, a ***potentially significant*** impact to trees would result.

Further analysis of this impact is included in the Biological Resources Chapter of the Sciortino Ranch Draft EIR.

f. In the year 2000, the East Contra Costa County Habitat Conservation Plan Association Agreement established the East Contra Costa Habitat Conservation Plan Association (HCPA) as the lead agency in drafting the Habitat Conservation Plan (HCP) for submittal to the governing boards and councils of member agencies, oversee compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), and would serve as the lead agency under CEQA for developing the HCP. The U.S. Fish and Wildlife Service signed the federal permit for the HCP on July 25, 2007, and the California Department of Fish and Game signed the state permit for the HCP on August 6, 2007. Therefore, as of August 6, 2007, East Contra Costa County has an officially approved HCP.

On November 13, 2007, the City of Brentwood approved an ordinance containing implementation procedures for the HCP/NNCP. The proposed project has the potential to conflict with the provisions of the East Contra Costa County HCP, which could result in a ***potentially significant*** impact to a regional habitat conservation plan.

Further analysis of this impact is included in the Biological Resources Chapter of the Sciortino Ranch Draft EIR.

V. CULTURAL RESOURCES. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	✖	☐	☐	☐
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?	✖	☐	☐	☐
c. Directly or indirectly destroy a unique paleontological resource on site or unique geologic features?	✖	☐	☐	☐
d. Disturb any human remains, including those interred outside of formal cemeteries.	✖	☐	☐	☐

Discussion

a. The City of Brentwood General Plan EIR (GP EIR) indicates that the Historic Properties Directory, published by the State Office of Historic Preservation, lists 14 properties within the Brentwood Planning Area. Two of these properties are also included in the National Register of Historic Places. The proposed project site currently contains a few structures that could have potential historic significance; therefore, development activities on the project site could result in the destruction or damage of historical resources. Therefore, a ***potentially significant*** impact could occur.

Further analysis of this impact is included in the Cultural Resources Chapter of the Sciortino Ranch Draft EIR.

b-d. Development associated with the proposed project, such as road improvements, utility corridors, and excavation associated with residential and commercial development, could result in the destruction or damage of archeological or paleontological resources. Therefore, a ***potentially significant*** impact could occur with regard to the destruction of unique archaeological and paleontological resources, and the disruption of human remains.

Further analysis of this impact is included in the Cultural Resources Chapter of the Sciortino Ranch Draft EIR.

VI. GEOLOGY AND SOILS. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist - Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area based on other substantial evidence of a known fault?	✖	☐	☐	☐
ii. Strong seismic ground shaking?	✖	☐	☐	☐
iii. Seismic-related ground failure, including liquefaction?	✖	☐	☐	☐
iv. Landslides?	☐	☐	☐	✖
b. Result in substantial soil erosion or the loss of topsoil?		✖	☐	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	✖	☐	☐
d. Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code?	☐	✖	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	✖

Discussion

ai-iii. According to the Brentwood General Plan Update, a number of faults in and adjacent to the City of Brentwood Planning Area are capable of producing ground shaking in Brentwood. Because the project site is subject to episodes of ground shaking, very loose to loose sands and silts may experience settlement due to seismic compaction (i.e., liquefaction). At buildout of the project site a potential exists for structures to be damaged by ground rupture or ground shaking. In addition, buildout of the project site would include construction-related activities and the eventual creation of additional structures that would be subject to seismic activities. This could result in a ***potentially significant*** impact related to ground shaking.

Further analysis of this impact is included in the Hazards and Hazardous Materials Chapter of the Sciortino Ranch Draft EIR.

aiv. The proposed project site is not susceptible to landslides because the area is essentially flat. Therefore, ***no impact*** would occur.

b. According to the Brentwood General Plan Update EIR, erosion potential of the soils within the Brentwood Planning Area is not a significant problem in most locations due to the generally flat topography and the cohesive nature of the soils. The proposed project site is generally flat and would have a very slight potential for soil erosion. However, buildout of the proposed project would involve construction-related activities and, during the early stages of construction, topsoil would be exposed due to grading and leveling of the site. Therefore, after grading and leveling and prior to overlaying the ground surface with structures, the potential exists for wind and water erosion to occur, which would adversely affect project site soils, causing a ***potentially significant*** impact to occur.

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

VI-2. Prior to issuance of grading permits, the project applicant shall submit, for the review and approval of the City Engineer, an erosion control plan that utilizes Best Management Practices (BMPs) to limit the erosion effects during construction of the proposed project. Measures could include, but are not limited to:

- *Hydro-seeding;*
- *Placement of erosion control measures within drainageways and ahead of drop inlets;*
- *The temporary lining (during construction activities) of drop inlets with "filter fabric" (a specific type of geotextile fabric);*
- *The placement of straw wattles along slope contours and back-of-curb prior to installation of landscaping;*
- *Directing subcontractors to a single designation "wash-out" location (as opposed to allowing them to wash-out in any location they desire);*
- *The use of siltation fences; and*
- *The use of sediment basins and dust palliatives.*

c. According to the Brentwood General Plan Update EIR, two types of ground failure - lateral spreading and liquefaction may be associated with seismic activities in the Brentwood Planning Area. Lateral spreading generally occurs on gently sloping to near horizontal slopes underlain by fine-grained, granular soils. Ground cracking and differential settlement are common within lateral spreading failures, and may result in structural failure and distortion of roads. Liquefaction occur most often in flat areas underlain by loose to moderately dense granular sediments (usually within 50 feet of the surface) and lead to a loss of bearing capacity, which may result in sinking of structures and embankments into liquefied soil and distortion of roads. Buildout of the proposed project would include construction-related activities that could have ***potentially significant*** impacts related to liquefaction and lateral spreading on the project site.

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

VI-3. *Prior to the approval of Improvement Plans and building permits, the project proponent shall submit a design-level geotechnical study to the City Engineer for review and approval, which specifically addresses whether expansive soils or soils prone to liquefaction are present in the development area, and includes measures to address these soils where they occur. All grading and foundation plans designed by the project Civil and Structural Engineer must be reviewed and approved by the City Engineer and Chief Building Official prior to issuance of grading and building permits to ensure that all geotechnical recommendations specified in the geotechnical report are properly incorporated and utilized in design. In addition, the applicant of the proposed project shall comply with UBC standards.*

d. The majority of the project site is made up of Brentwood clay loam (Bb), and Capay clay (CaA). According to the Soil Survey of Contra Costa County, California, a portion of the proposed project consists of Capay Clay (CaA), 0–2 percent slope, which exhibits qualities of expansive soils. The Brentwood General Plan Update EIR indicates that when buildings or streets are placed on this expansive soil, foundations may rise each wet season and fall each dry season. Movements may vary under different parts of a building or street resulting in cracking foundations and street surfaces, distorting various structural portions of a building, and warping doors and windows so that they do not function properly. However, buildout of the proposed project would include construction-related activities that could result in a ***potentially significant*** impact associated with expansive soils.

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

VI-4. *Implement Mitigation Measure VI-2.*

e. The project site would to be connected to the City sewer system. Therefore, ***no impact*** would occur related to soils incapable of adequately supporting the use of septic tanks.

VII. HAZARDS AND HAZARDOUS MATERIALS. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	✖	☐	☐	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	✖	☐	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	✖	☐	☐	☐
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	✖
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	✖
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	✖
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	✖	☐	☐	☐
h. Expose people or structures to the risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	✖	☐	☐	☐

Discussion

a-c. Buildout of the proposed project would include up to approximately 608 dwelling units of various densities, commercial and office uses, neighborhood parks, and institutional uses (most likely a community college). The land uses included in the proposed project would not involve the routine use, transport, or disposal of hazardous materials within the residential areas or school sites. However, because portions of the proposed project site have been used for agricultural purposes in the past, the project site could contain materials that may be considered hazardous, such as residual pesticides, wells, and underground storage tanks (USTs). A natural gas well in the northeast corner of the project site is currently in the process of being abandoned and remediated. Therefore,

because the project site could contain hazardous substances and/or materials, a ***potentially significant*** impact associated with hazardous materials would occur.

Further analysis of this impact is included in the Hazards and Hazardous Materials Chapter of the Sciortino Ranch Draft EIR.

d. The project site has not been identified on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. As a result, the proposed project would not create a significant hazard to the public or the environment. Therefore, ***no impact*** would occur.

e,f. The proposed project site is not within an airport land use plan or within two miles of an airport. Therefore, ***no impact*** would occur.

g. Development of the project site could interfere with an adopted emergency response plan or emergency evacuation plan. At buildout of the project site, the additional traffic generated by the development of residential and other uses could interfere with evacuation or response routes used by emergency response teams. Therefore, a ***potentially significant*** impact could occur.

Further analysis of this impact is included in the Hazards and Hazardous Materials Chapter of the Sciortino Ranch Draft EIR.

h. Wildland fire hazards threaten lives, property, and natural resources throughout the City. Wildfire is a serious hazard in undeveloped areas and on large lots with extensive areas of unirrigated vegetation because natural vegetation and dry-farmed grain areas are extremely flammable during the late summer and fall. According to the City of Brentwood General Plan, the greatest fire concern is the urban/wildland interface, or the edges of development that meet rural areas. The urbanized portions of the City of Brentwood are in areas of low wildfire hazard; however, buildout of the proposed project would include development of existing rural areas that have a greater amount of vegetation and are more prone to fire. Therefore, a ***potentially significant*** impact related to wildland fires could result.

Further analysis of this impact is included in the Hazards and Hazardous Materials Chapter of the Sciortino Ranch Draft EIR.

VIII. HYDROLOGY AND WATER QUALITY. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements?	☐	✖	☐	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	✖	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	✖	☐	☐
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	✖	☐	☐
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	✖	☐	☐
f. Otherwise substantially degrade water quality?	☐	✖	☐	☐
g. Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	✖	☐
h. Place within a 100-year floodplain structures which would impede or redirect flood flows?	☐	☐	✖	☐
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	☐	☐	✖	☐
j. Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	✖

Discussion

a,f. The proposed project would involve construction-related activities and, during the early stages of construction, topsoil would be exposed due to grading and leveling of the site. Therefore, after grading and leveling and prior to overlaying the ground surface with structures, the potential exists for wind and water erosion and discharge of sediment and/or urban pollutants into project stormwater runoff, which could adversely affect water quality. In addition, the proposed project would result in the generation of increased urban runoff from the creation of substantial impervious areas, which could contribute urban runoff constituents to downstream surface waters.

The federal Clean Water Act prohibits the discharge of pollutants to navigable waters from point and non-point sources unless authorized by a NPDES permit. Point source discharges generally pertain to discharges from wastewater treatment facilities or other identifiable dischargers. Non-point discharges generally pertain to areawide or stormwater discharges. In California, NPDES permits are issued and enforced by the Regional Water Quality Control Boards. The City of Brentwood is located within the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB). The City has NPDES permit coverage from the RWQCB, as a co-permittee with the Contra Costa County Clean Water Program.

On March 10, 2003, the State Water Resources Control Board began regulating all stormwater discharges associated with construction activities where clearing, grading, or excavation results in a land disturbance of one or more acres. Performance Standard NDCC-13 of the City's NPDES permit requires applicants to show proof of coverage under the State's General Construction Permit prior to receipt of any construction permits.

The RWQCB has adopted a separate NPDES General Permit for stormwater discharge associated with construction activity. Stormwater runoff from construction sites of one acre or more must be covered under the State's General Construction Activity Stormwater Permit and must be managed by a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP describes measures to control or minimize pollutants from entering stormwater. Developers of projects of five acres or more must develop a SWPPP that addresses both grading/erosion impacts and non-point source pollution impacts of the development project, including post-construction impacts. In addition, the City of Brentwood requires all development projects to use Best Management Practices (BMPs) to treat all runoff.

In addition, all municipalities within Contra Costa County (and the County itself) are required to develop more restrictive surface water control standards for new development projects as part of the renewal of the Countywide NPDES permit. Known as the "C.3 Standards," new development and redevelopment projects that disturb one or more acres of land area must contain and treat stormwater runoff from the site. Enhanced BMPs to protect stormwater runoff from any project that creates 10,000 square feet of new or developed impervious area are also required under the C.3 Standards.

The proposed project would be subject to the requirements of the State Water Resources Control Board (SWRCB) and the RWQCB, including the C.3 Standards, which are included in the City's NPDES General Permit. Should the proposed project not comply with State and regional regulations concerning stormwater pollution, the project's construction activities would result in degradation of downstream water quality. Therefore, a ***potentially significant*** impact could occur.

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

VIII-5. *Prior to the issuance of grading permits, the applicant shall obtain and comply with the NPDES General Construction Permit, including the submittal of a Notice of Intent (NOI) and associated fee to the SWRCB, and the preparation of a Storm Water Pollution Prevention Plan (SWPPP) for review and approval of the City Engineer. The SWPPP shall serve as the framework for identification, assignment, and implementation of Best Management Practices (BMPs). The developer shall implement BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable. The SWPPP shall be submitted to the City Engineer for review and approval and shall remain on the project site during all phases of construction. Following implementation of the SWPPP, the developer shall subsequently demonstrate the SWPPP's effectiveness and provide for necessary and appropriate revisions, modifications, and improvements to reduce pollutants in stormwater discharges to the maximum extent practicable.*

b. The Brentwood 2001 General Plan indicates that water is provided by the City of Brentwood, and the primary water supply is groundwater supplemented by treated surface water. Increased development associated with General Plan buildout would lead to an increase in impervious surfaces where permeable soils currently exist. Whereas open space allows precipitation to infiltrate into the ground, impervious surfaces cause water to pond or runoff, thereby reducing groundwater recharge. Because the proposed project would place residential and commercial development on land that currently consists of primarily pervious surfaces, buildout of the project could reduce groundwater recharge. However, because the General Plan EIR includes mitigation measures to reduce impacts to groundwater supplies and recharge to a less-than-significant level, and because development of the project site with impervious surfaces is consistent with the General Plan, the project would have a ***less-than-significant*** impact on groundwater recharge.

c-e. The project site is proposed for development of residential dwellings of various densities, commercial and office uses, neighborhood parks, and institutional uses (most likely a community college) consistent with the General Plan, which designates the area for urban uses. Buildout of the project site would add impervious surfaces to the area. Therefore, an increase in impervious surfaces could result in a decrease in infiltration rates and an increase in stormwater runoff rates.

Buildout of the proposed project would require expanded storm drain lines for the project area. Therefore, because the project would result in an increase in stormwater runoff rates and would require infrastructure improvements within, and potentially outside, the project site, a ***potentially significant*** impact could result.

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

VIII-6. *Prior to the issuance of building permits, the design of drainage facilities for the project shall meet with the approval of both the City Engineer and the Contra Costa County Flood Control and Water Conservation District (CCCFCWCD).*

VIII-7. *Prior to the issuance of building permits, the project applicant shall pay CCCFCWCD drainage fees for the project site.*

g-i. According to the Flood Zones and Drainage Map found in the General Plan Update EIR and Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Panel Number 0600250355C, the proposed project is not located within the 100-year floodplain. Because buildout of the proposed project would not place within the 100-year floodplain structures that would impede or redirect flood flows, and would not expose people or structures to a significant risk of loss, injury, or death involving flooding, the project would result in a ***less-than-significant*** impact associated with development within the 100-year floodplain.

j. Tsunamis are defined as sea waves created by undersea fault movement. A tsunami poses little danger away from shorelines; however, when tsunamis reach the shoreline, high swells of water break and wash inland with great force. Waves may reach fifty feet in height on unprotected coasts. Historic records of the Bay Area used by one study indicate that nineteen tsunamis were recorded in San Francisco Bay during the period from 1868 to 1968. Maximum wave height recorded at the Golden Gate tide gauge (where wave heights peak) was 7.4 feet. The available data indicate a standard decrease of original wave height from the Golden Gate to about half the original wave height on the shoreline near Richmond, and to nil at the head of the Carquinez Strait. As the City of Brentwood is several miles inland from the Carquinez Strait, the project area is not exposed to flooding risks from tsunamis.

A seiche is a long-wavelength, large-scale wave action set up in a closed body of water such as a lake or reservoir, with destructive capacity that is not as great as that of a tsunami. Seiches are known to have occurred during earthquakes, but none have been recorded in the Bay Area. In addition, the project is not located near a closed body of water; therefore, the proposed project area is not anticipated to be impacted by seiches. Furthermore, as mudflows typically occur in mountainous or hilly terrain, and the project area and surrounding areas are relatively flat, danger would not be presented from the likelihood of mudflows.

The above analysis indicates that the project site would not be threatened by a seiche, tsunami, or mudflow; therefore, ***no impact*** from such phenomena would occur.

IX. LAND USE AND PLANNING. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Physically divide an established community?	☐	☐	☐	✖
b. Conflict with any applicable land use plans, policies, or regulations of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating on environmental effect?	✖	☐	☐	☐
c. Conflict with any applicable habitat conservation plan or natural communities conservation plan?	✖	☐	☐	☐

Discussion

a. The project area is generally developed with residential, commercial, industrial, and public facility uses. The proposed project would develop an area that is currently vacant and would not divide an established community. Therefore, the proposed project would result in ***no impact*** to an established community.

b. The City of Brentwood General Plan land use designations for the project site include Mixed-Use Business Park (MUBP) and Very High Density Residential (VHDR). The surrounding General Plan land use designations include General Commercial (GC), Medium Density Residential (MDR), and Low Density Residential (LDR). The current zoning designation for the project site is Planned Development (PD) – 55. Therefore, because the proposed project involves changing the current General Plan and zoning designations within the project site, a ***potentially significant*** impact could occur.

Further analysis of this impact is included in the Land Use Chapter of the Sciortino Ranch Draft EIR.

c. In the year 2000, the East Contra Costa County Habitat Conservation Plan Association Agreement established the East Contra Costa Habitat Conservation Plan Association (HCPA) as the lead agency in drafting the Habitat Conservation Plan (HCP) for submittal to the governing boards and councils of member agencies, oversee compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), and would serve as the lead agency under CEQA for developing the HCP. The U.S. Fish and Wildlife Service signed the federal permit for the HCP on July 25, 2007, and the California Department of Fish and Game signed the state permit for the HCP on August 6, 2007. Therefore, as of August 6, 2007, East Contra Costa County has an officially approved HCP.

Development of the proposed project site has the potential to conflict with the provisions of the East Contra Costa County HCP, which could result in a ***potentially significant*** impact to a regional habitat conservation plan.

Further analysis of this impact is included in the Biological Resources Chapter of the Sciortino Ranch Draft EIR.

X. MINERAL RESOURCES. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	✖	☐
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	✖	☐

Discussion

a,b. The 2001 Brentwood General Plan EIR identifies coal, oil and gas, and sand as the significant mineral resources within the Brentwood Planning Area. The General Plan indicates that the production of coal has not occurred in the area since 1902, and that sand deposits could remain in the western portion of the Brentwood Planning Area. Oil and gas are presently being produced in the northwest portion of the Brentwood Planning Area, and the potential for additional reserves exists throughout the City. The Brentwood General Plan EIR, Figure 3.11-1, identifies a few inactive oil/gas wells on the project site. The existing gas well that is located in the northeast portion of the proposed project site is would be properly abandoned prior to the proposed development of the site. In addition, the proposed project includes an open space/park area around the well location, which would allow potential future access to any remaining reserves. Therefore, the proposed project would not result in the loss of availability of a known mineral resource, resulting in a ***less-than-significant*** impact to mineral resources.

XI. NOISE. *Would the project result in:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	✖	☐	☐	☐
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	✖	☐	☐	☐
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	✖	☐	☐	☐
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	✖	☐	☐	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	✖
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	✖

Discussion

a-d. Buildout of the proposed project would involve the construction of up to approximately 608 residential dwelling units in various densities, 107,267 square feet of retail, office, and commercial, 228,690 sq. feet. of institutional uses, and 5.1 acres of parks. The proposed residential uses would be considered sensitive receptors and could be adversely impacted by noise sources. The principal existing traffic noise sources in the project vicinity include traffic along major roadways surrounding the project site.

The noise level that the proposed project would generate also needs to be considered in order to provide a comprehensive noise analysis. Of particular importance is the sensitive receptors (residential, schools) surrounding the project site. Buildout of the proposed project would result in temporary construction-related noise, as well as increased vehicle trips on project area roadways. The increased noise levels associated with construction and increased vehicle trips could result in exterior and/or interior residential noise standards being exceeded. Therefore, the proposed project could have a ***potentially significant*** impact in regard to exposing people to unacceptable noise levels.

Further analysis of this impact is included in the Noise Chapter of the Sciortino Ranch Draft EIR.

e,f. The proposed project is not located near an existing airport and is not within an area covered by an existing airport land use plan. Therefore, ***no impact*** would occur.

XII. POPULATION AND HOUSING. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	✖	☐	☐	☐
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	✖
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	✖

Discussion

a. Buildout of the proposed project would result in a significant population growth from anticipated residential development. Therefore, population growth from the proposed project would result in a ***potentially significant*** impact to population growth in the City of Brentwood.

Further analysis of this impact is included in the Statutorily Required Sections chapter of the Sciortino Ranch Draft EIR.

b,c. The project site does not contain any residences. Therefore, the development of the project site is not anticipated to cause any displacement of existing housing or people within the project area, and ***no impact*** would occur.

XIII. PUBLIC SERVICES AND UTILITIES. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Fire protection?	✖	☐	☐	☐
b. Police protection?	✖	☐	☐	☐
c. Schools?	✖	☐	☐	☐
d. Parks?	✖	☐	☐	☐
e. Other Public Facilities?	✖	☐	☐	☐

Discussion

a,b. The proposed project is located within the jurisdiction of, and is currently provided services by, the East Contra Costa Fire Protection District and the City of Brentwood Police Department. Development of the proposed project site would not expand either district's boundaries. The population increase associated with buildout of the project would add to the overall demand for police and fire protection services in the City of Brentwood. Therefore, a ***potentially significant*** impact would result to fire protection and law enforcement services.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

c. The City of Brentwood is served by the Brentwood Union School District, the Knightsen School District, and the Liberty Union High School District. Elementary schools in the area are currently operating at 85 percent of their capacity and the middle schools, as a whole, have a population that exceeds capacity (Brentwood General Plan EIR, p. 3.8-5). The majority of schools in the area districts are under capacity; however, buildout of the proposed residential communities included in the project would result in increased demands on the existing schools; therefore, the impact to schools would be ***potentially significant***.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

d. The City of Brentwood's parks are maintained by the Brentwood Parks and Recreation Department. The City collects fees for development within the City of Brentwood and ensures the implementation of parks through the development process. The City adopted a Parks, Trails, and Recreation Master Plan, which establishes the goals, policies, and objectives under which the City's parks, trails, and recreation facilities are developed and managed.

The anticipated growth in the City population resulting from the buildout of the project site would determine the amount of park space needed proportional to the number of new

residents. The standard requirement in the Parks, Trails, and Recreation Master Plan is five acres of parkland per 1,000 residents. However, the amount of park acreage provided by the proposed project may not be sufficient to meet City standards; therefore, the proposed project could have a ***potentially significant*** impact to parks.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

e. The Brentwood Library is the only public library located in the City of Brentwood. The Brentwood Library is part of the Contra Costa County Library system, which enables the relatively small Brentwood Library to access all of the other libraries that are part of the Contra Costa Library system to obtain information not found in the Brentwood Library, if requested by customers.

Development of the proposed project would introduce new residents to the City of Brentwood. The introduction of new residents to the City of Brentwood would be expected to create an increased demand on the library's current limited material and personnel resources; therefore, the proposed project could have a ***potentially significant*** impact to the Brentwood Library.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

XIV. RECREATION. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	✖	☐	☐	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	✖	☐	☐	☐

Discussion

a,b. The City of Brentwood General Plan encourages urban development that is based on open space throughout and around established communities. Implementation of the proposed project would not immediately increase the demand for neighborhood, community, and regional parks and other recreation facilities. However, buildout of the proposed project would eventually increase the population in the vicinity, thereby increasing the demand for parks and recreational facilities. Therefore, a ***potentially significant*** impact would occur.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

XV. TRANSPORTATION AND CIRCULATION. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	✖	☐	☐	☐
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	✖	☐	☐	☐
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	✖
d. Substantially increase hazards due to a design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	✖	☐	☐	☐
e. Result in inadequate emergency access?	✖	☐	☐	☐
f. Result in inadequate parking capacity?	☐	☐	✖	☐
g. Conflicts with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	✖	☐	☐	☐

Discussion

a,b. At buildout, the proposed project would result in the addition of residential units, commercial and office uses, retail, parks, and institutional uses to the Brentwood Planning Area. Roadways that are within or surround the project area consist of Brentwood Boulevard (State Route 4) running north and south and Sand Creek Road on the west side, which is planned to continue east through the project site in the future. The increase in daily vehicle trips generated by the proposed project, at buildout, along these roadways could adversely affect existing Levels of Service (LOS) at nearby intersections. Therefore, the increase in traffic generated by the project, as well as the extension of existing roadways and the construction of new roadways could have a ***potentially significant*** impact.

Further analysis of this impact is included in the Transportation and Circulation Chapter of the Sciortino Ranch Draft EIR.

c. The proposed project would not require any changes to existing regional air traffic activity and the project area is not located near an airport. Therefore, ***no impact*** would occur.

d,e. At buildout of the project site, the potential exists for an increase in hazards due to design features or incompatible uses, or inadequate emergency access to the project site Therefore, a ***potentially significant*** impact could result.

Further analysis of this impact is included in the Transportation and Circulation Chapter of the Sciortino Ranch Draft EIR.

f. Implementation of the project site would result in the buildout of residential, commercial and office uses, and retail development. All future development within the proposed project site will be required to comply with parking requirements included in the Brentwood Municipal Code and the Sciortino Ranch Design Guidelines. Therefore, impacts related to parking would be ***less-than-significant***.

g. Tri-Delta Transit and the City of Brentwood jointly provide transit service throughout the City of Brentwood. According to Figure 3.4-3 of the Brentwood General Plan EIR, transit routes currently exist within the project area along Brentwood Boulevard and Sand Creek Road. However, the Brentwood General Plan EIR (p. 3.4-32) also states that limited transit service exists for residents in the City of Brentwood.

Because the proposed project, at buildout, would include residential development in areas that may not be served by Tri-Delta Transit and the City, several pedestrian access routes to facilitate pedestrian movement could be needed. Although pedestrian and bicycle facilities and access are currently adequate to serve the proposed project area, these facilities could be adversely impacted by the future development of the proposed project. Therefore, a ***potentially significant*** impact would occur.

Further analysis of this impact is included in the Transportation and Circulation Chapter of the Sciortino Ranch Draft EIR.

XVI. UTILITIES AND SERVICE SYSTEMS. *Would the project:*	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	✖	☐	☐	☐
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	✖	☐	☐	☐
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	✖	☐	☐	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	✖	☐	☐	☐
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	✖	☐	☐	☐
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	✖	☐	☐	☐
g. Comply with federal, state, and local statutes and regulations related to solid waste?	✖	☐	☐	☐

Discussion

a,e. At buildout, the proposed project would introduce residential and other uses; such as office, industrial, institutional uses and parks. The existing wastewater treatment plant for the area may not be able to adequately serve the generation of additional wastewater at buildout of the project site. In addition, the proposed project would require the construction of additional wastewater infrastructure to serve the needs of the project. Therefore, because the proposed project would increase the demands on the existing wastewater treatment plant and sewer conveyance infrastructure to a level that the system may not be able to accommodate, a ***potentially significant*** impact would result.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

b,d. At buildout, the proposed project would include residential and other uses; such as office, industrial, institutional uses and parks. Future development of the proposed project would, therefore, contribute to the increased demand for water services in the City of Brentwood. The City's existing water supply and delivery infrastructure may not be able

to accommodate the increased demand for water services and, as a result, a ***potentially significant*** impact would occur.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

c. At buildout, the project site would include urban land uses, which would create impervious surfaces that did not previously exist. The impervious surfaces would result in increased stormwater runoff rates on the project site. The existing infrastructure, including the Marsh Creek Channel, may not be able to accommodate the additional stormwater flows that would occur at buildout of the proposed project site. As a result, a ***potentially significant*** impact would occur.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

f,g. At buildout, the project site would include residential, commercial and office uses, parks, retail and institutional uses (which could include a community college). Future development of the project would, therefore, generate additional population in the City and would necessitate additional services related to recycling, collection, hauling, storage, and education pertaining to solid waste. Impacts associated with buildout of the proposed project site would be considered ***potentially significant***.

Further analysis of this impact is included in the Public Services and Utilities Chapter of the Sciortino Ranch Draft EIR.

XII. MANDATORY FINDINGS OF SIGNIFICANCE.	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less-Than-Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	✖	☐	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	✖	☐	☐	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	✖	☐	☐	☐

Discussion

a. While the project site is surrounded by residential development to the east, north and south and commercial to the west, future buildout of the proposed project site could result in impacts to special-status wildlife or plant species, and cultural resources. Therefore, a ***potentially significant*** impact would occur.

Further analysis of this impact is included in the Sciortino Ranch Draft EIR.

b,c. The proposed project would add traffic and housing to the project area and would remove vacant and underutilized land currently on the site. Cumulative impacts may be identified in the categories of an increased demand for services and resources and physical changes to the natural environment. These impacts could result in adverse effects on human beings. Such impacts may also be considered to achieve short-term goals, to the disadvantage of long-term environmental goals. Therefore, the project's cumulative impacts would be considered ***potentially significant***.

Further analysis of this impact is included in the Sciortino Ranch Draft EIR.

APPENDIX D

Traffic Impact Analysis

Sciortino Ranch

Final:
January 30, 2009

Prepared for:

The City of Brentwood, California

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EXECUTIVE SUMMARY

This report documents the results of a traffic impact analysis completed for Sciortino Ranch (the "proposed project" or "project") a 60 acre mixed-use project to be located east of Brentwood Boulevard, on the north and south side of the future Sand Creek Road in the City of Brentwood, California. The project is proposed to consist of 468 apartment units, 148 single family selling units, 107.3 k.s.f. of retail uses, 88 k.s.f. of office uses, and a 228.7 k.s.f community college. The purpose of this impact analysis is to identify potential environmental impacts to transportation facilities as required by the California Environmental Quality Act (CEQA).

The following intersections, listed with existing traffic control, are included in this traffic impact analysis:

1. Brentwood Blvd @ Lone Tree Way (Signalized)
2. Brentwood Blvd @ Sunrise Dr (Side Street Stop Control)
3. Brentwood Blvd @ Gregory Ln (Side Street Stop Control)
4. Brentwood Blvd @ Homecoming Way (Side Street Stop Control)
5. Brentwood Blvd @ Grant St/Sunset Rd (Signalized)
6. Brentwood Blvd @ Sunset Ct (Side Street Stop Control)
7. Brentwood Blvd @ Havenwood Ave (Side Street Stop Control)
8. Brentwood Blvd @ Applewood Common (Signalized)
9. Brentwood Blvd @ Sand Creek Rd (Signalized)
10. Brentwood Blvd @ Technology Way (Signalized)
11. Brentwood Blvd @ Village Dr (Side Street Stop Control)
12. Brentwood Blvd @ Central Blvd/Sycamore Ave (Signalized)
13. Sand Creek Rd @ O'Hara Ave (Signalized)

The following roadway segments are also included in this traffic impact analysis:

1. Lone Tree Way west of Brentwood Boulevard
2. Brentwood Blvd north of Sand Creek Road
3. Brentwood Blvd south of Sand Creek Road
4. Sand Creek Road west of Brentwood Boulevard

The level of service analysis was conducted for the study facilities for both weekday AM and PM peak-hours for the following scenarios:

A. Existing (2008) Conditions
B. Existing plus Approved Projects Conditions
C. Existing plus Approved Projects plus Proposed Project Conditions
D. Cumulative (2030) Conditions
E. Cumulative (2030) plus Proposed Project Conditions

Significant findings of this study include:

- The project will generate 13,129 daily, 1,244 AM peak-hour, and 1,280 PM peak-hour vehicle trips.
- The proposed project is expected to result in significant impacts at a number of intersections under Existing plus Approved Projects plus Proposed Project and Cumulative plus Proposed Project scenarios. These impacts can be mitigated to be less than significant.
- The proposed project is expected to result in a significant impact to one roadway segment under cumulative plus proposed project conditions. This impact can be mitigated to be less than significant.
- The proposed project is not expected to result in impacts to bicycle, pedestrian, or transit facilities.
- The project alternatives will generate significantly fewer trips and result in lesser impacts than the proposed project.

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INTRODUCTION

This report documents the results of a traffic impact analysis completed for Sciortino Ranch (the "proposed project" or "project") in the City of Brentwood, California. The purpose of this impact analysis is to identify potential environmental impacts to transportation facilities as required by the California Environmental Quality Act (CEQA).

The remaining sections of this report document the proposed project, analysis methodologies, impacts and mitigation, and general study conclusions.

PROJECT DESCRIPTION

The proposed project consists of approximately 60.2 acres, and is located east of Brentwood Boulevard at Sand Creek Road. The site is proposed to consist of 468 apartment units, 148 single family selling units, 107.3 k.s.f. of retail uses, 88 k.s.f. of office uses, and a 228.7 k.s.f community college. The project location is shown in Figure 1 and the project's proposed zoning is shown in Figure 2.

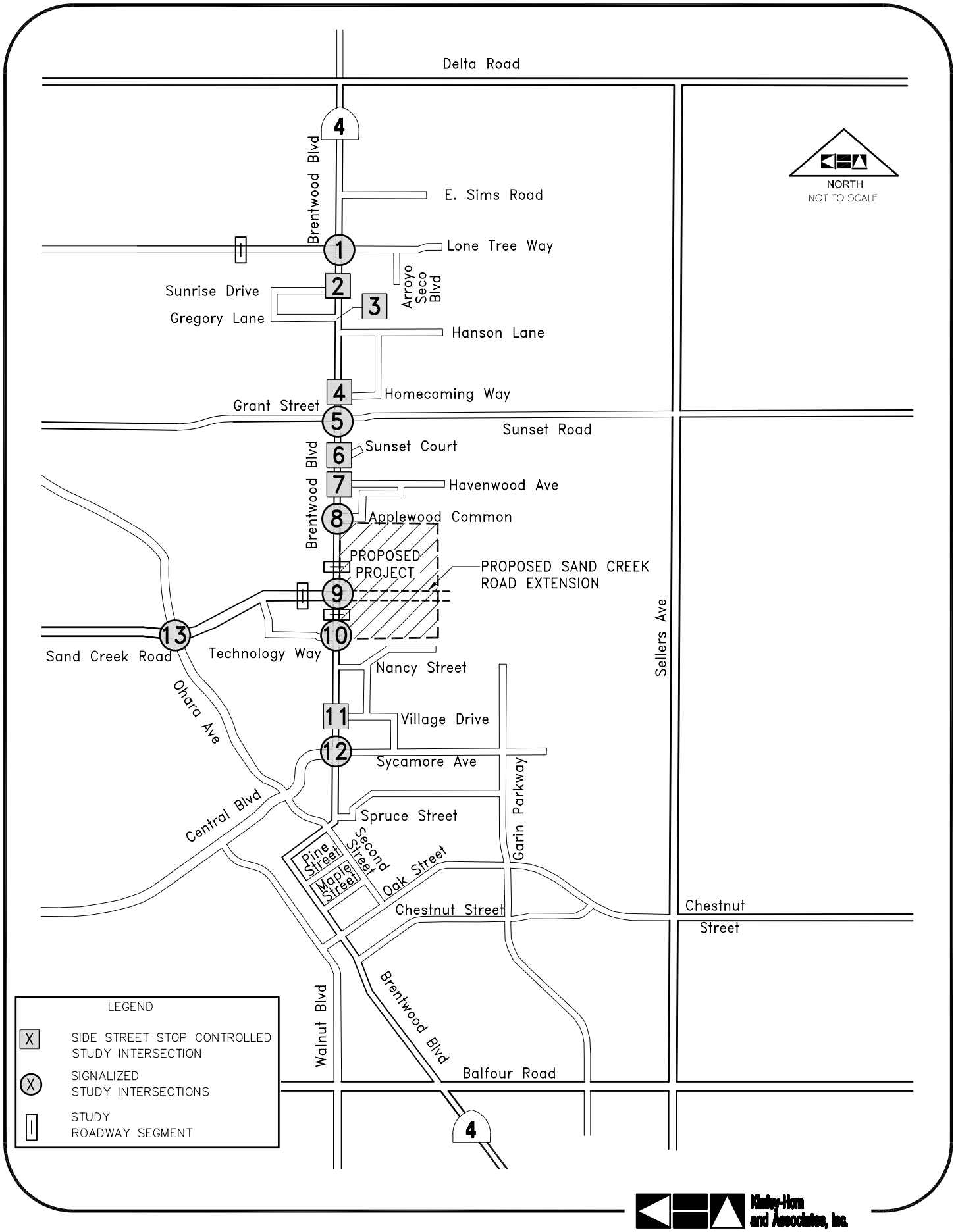
The following intersections, listed with existing traffic control, are included in this traffic impact analysis:

1. Brentwood Blvd @ Lone Tree Way (Signalized)
2. Brentwood Blvd @ Sunrise Dr (Side Street Stop Control)
3. Brentwood Blvd @ Gregory Ln (Side Street Stop Control)
4. Brentwood Blvd @ Homecoming Way (Side Street Stop Control)
5. Brentwood Blvd @ Grant St/Sunset Rd (Signalized)
6. Brentwood Blvd @ Sunset Ct (Side Street Stop Control)
7. Brentwood Blvd @ Havenwood Ave (Side Street Stop Control)
8. Brentwood Blvd @ Applewood Common (Signalized)
9. Brentwood Blvd @ Sand Creek Rd (Signalized)
10. Brentwood Blvd @ Technology Way (Signalized)
11. Brentwood Blvd @ Village Dr (Side Street Stop Control)
12. Brentwood Blvd @ Central Blvd/Sycamore Ave (Signalized)
13. Sand Creek Rd @ O'Hara Ave (Signalized)

The following roadway segments are also included in this traffic impact analysis:

1. Lone Tree Way west of Brentwood Boulevard
2. Brentwood Blvd north of Sand Creek Road
3. Brentwood Blvd south of Sand Creek Road
4. Sand Creek Road west of Brentwood Boulevard

Figure 3 illustrates the study facilities, existing traffic control, and existing lane configurations.

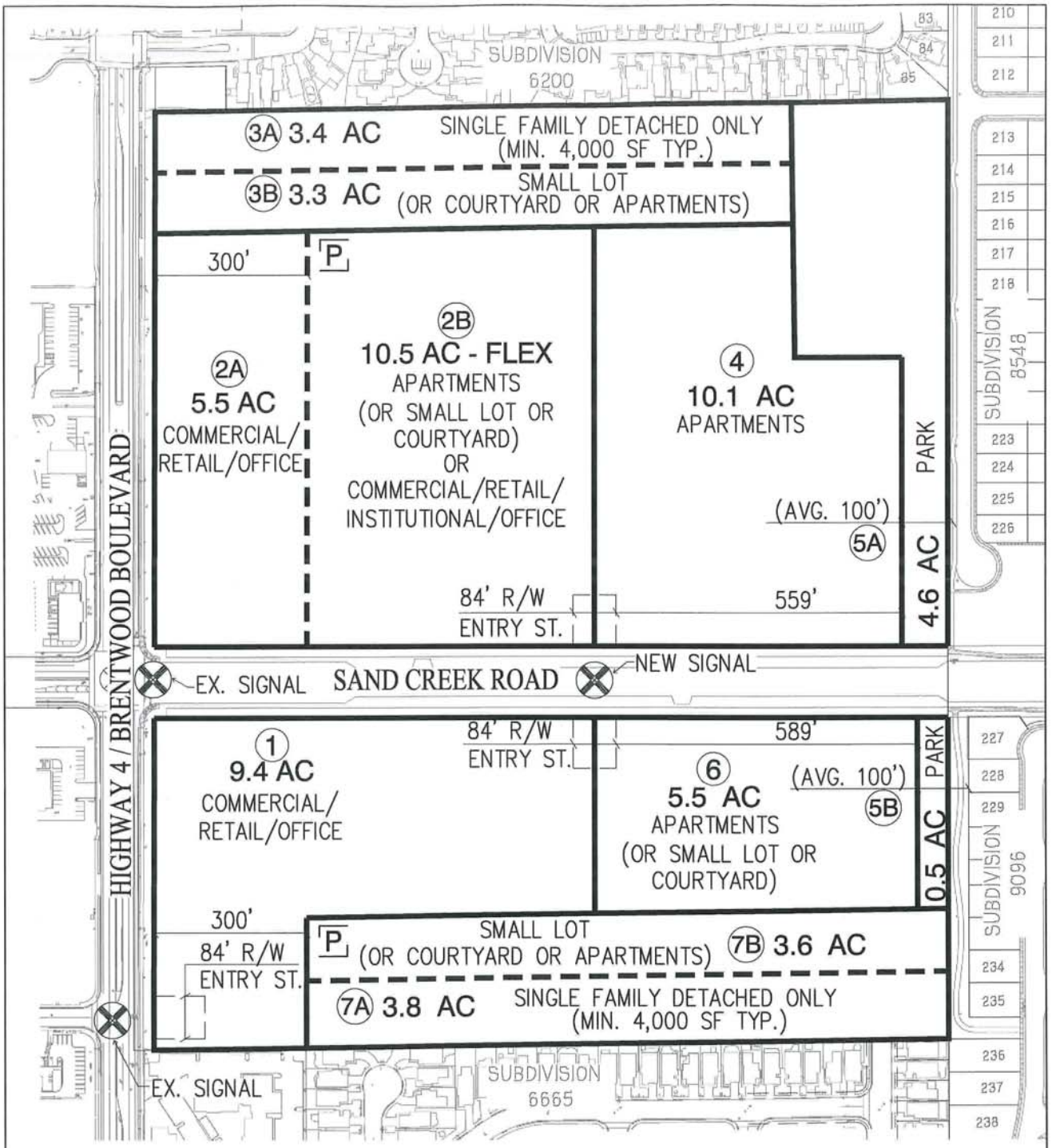


Kimley-Horn and Associates, Inc.

FIGURE 1

PROJECT VICINITY MAP

SCIORTINO RANCH
BRENTWOOD, CA



NOTES:

1. SEE ZONING MATRIX FOR DETAILED DESCRIPTION OF ALL PERMITTED AND CONDITIONALLY PERMITTED USES.
2. CIRCULATION IS PRELIMINARY.
3. NEW INTERSECTION MUST BE LOCATED A MINIMUM OF 800' FROM BRENTWOOD BLVD.
4. LINEAR PARKS ALONG THE EASTERN BORDER ARE 100' MINIMUM IN WIDTH, AS MEASURED FROM THE EXISTING BACK OF SIDEWALK AND/OR THE PROPERTY LINE OF THE ADJACENT OPEN SPACE.
5. FLOATING "P" PARK SYMBOLS ARE NOT LOCATION OR SIZE SPECIFIC. SYMBOLS ARE AN INDICATION OF THE NECESSITY OF A PARK WITHIN THE ASSOCIATED SUBAREA.

DRAFT

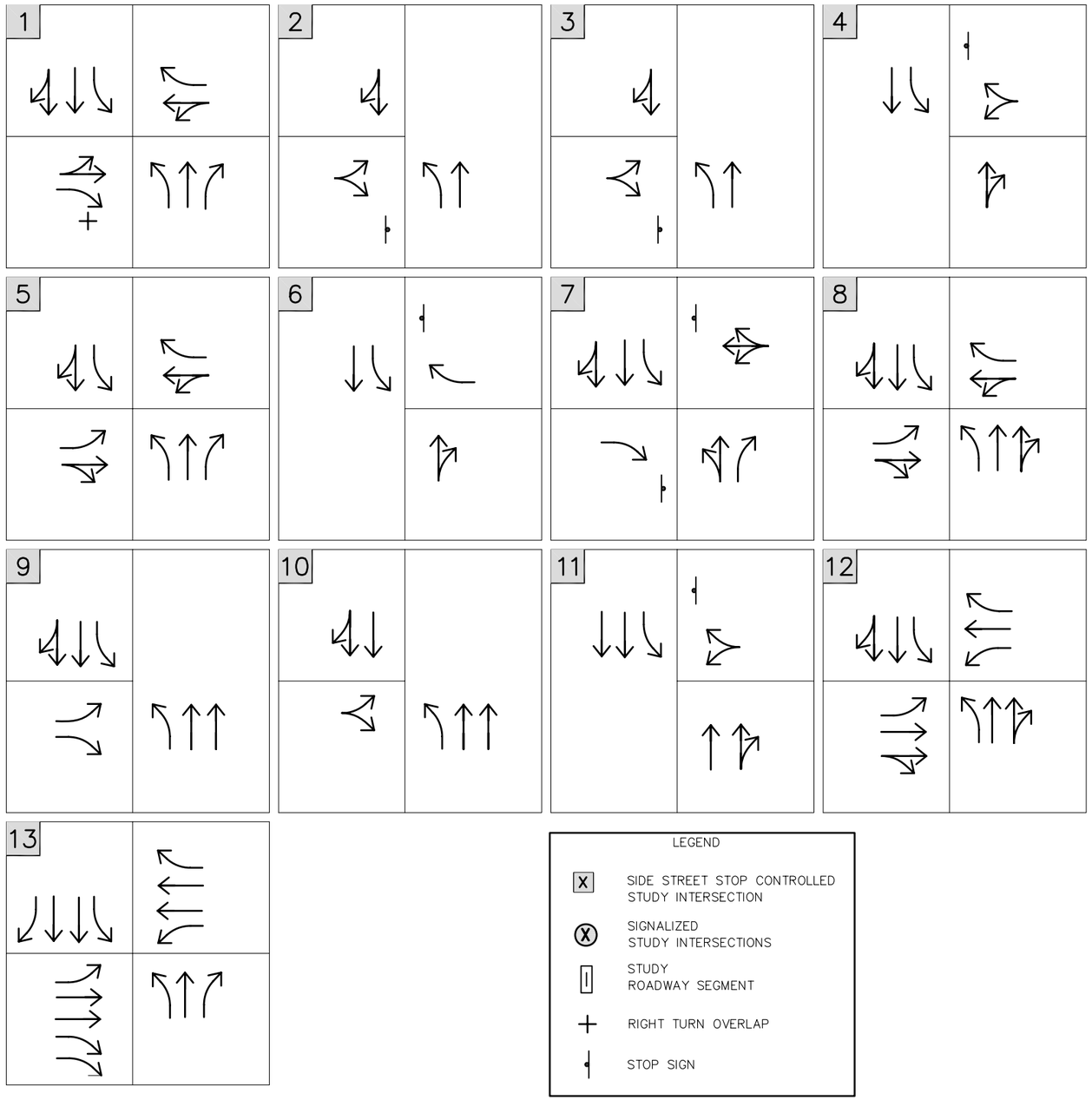
SCIORTINO RANCH

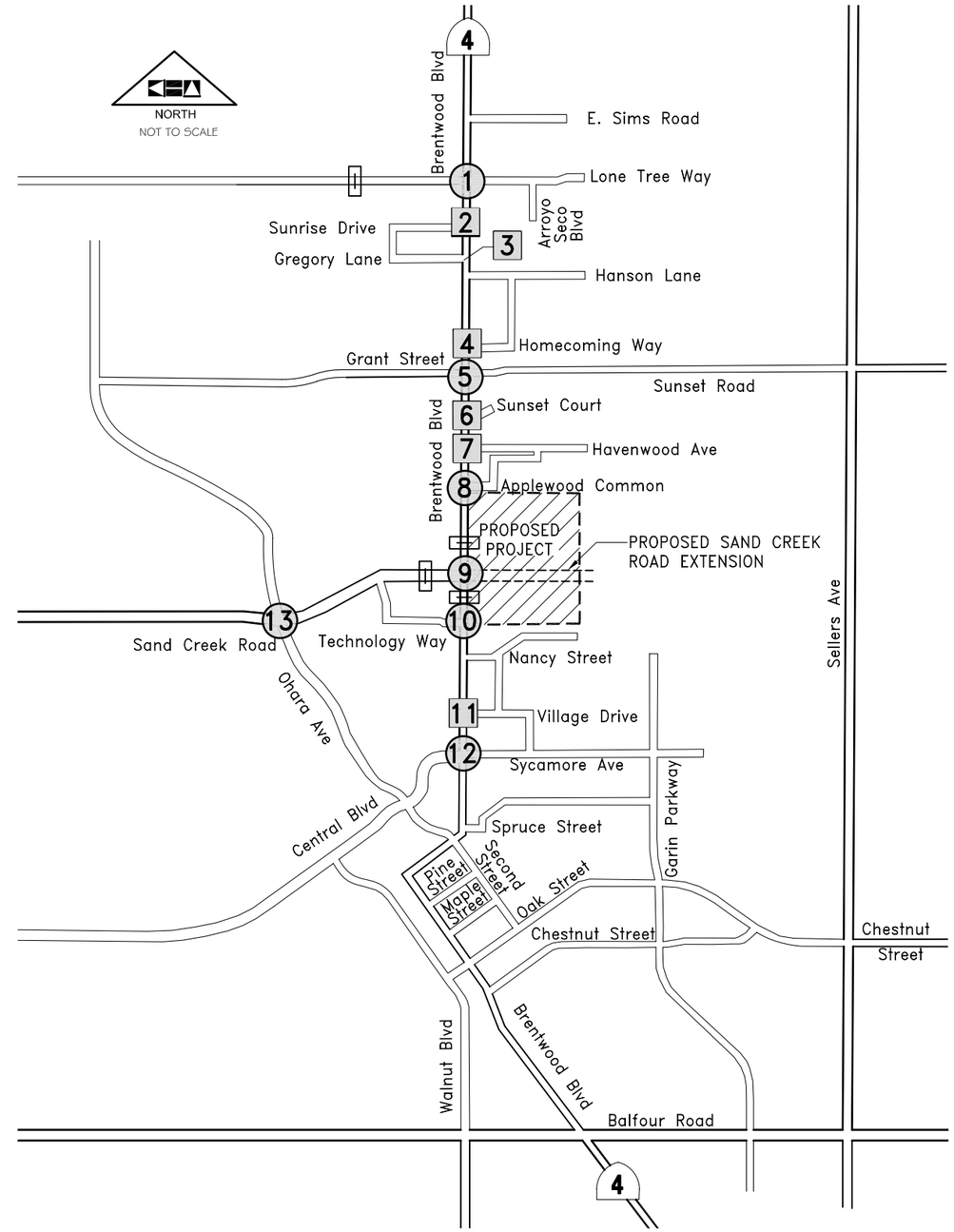
PD 55 ZONING

DEVELOPMENT SUBAREA MAP

CITY OF BRENTWOOD CONTRA COSTA COUNTY CALIFORNIA

FIGURE 2 - PROPOSED PROJECT SITE PLAN





Kimley-Horn and Associates, Inc.

FIGURE 3

PROJECT LOCATION AND STUDY INTERSECTIONS

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PROJECT AREA TRANSPORTATION FACILITIES

Roadways

The following are descriptions of the primary roadways in the vicinity of the project.

Brentwood Boulevard is a north-south arterial roadway which traverses through the project area. Within the City, Brentwood Boulevard is also designated as State Route 4 (SR-4) that provides connectivity between communities in the Sierra Nevada Mountains, the San Joaquin Valley, and the San Francisco Bay Area. South of Havenwood Avenue, Brentwood Boulevard is a four-lane roadway with curbs, gutters, and no on-street parking. North of Havenwood Avenue, Brentwood Boulevard is a two-lane facility without paved shoulders. The roadway is fronted by a wide variety of commercial and industrial uses, with numerous driveways to adjacent parcels. Within the general project area, Brentwood Boulevard currently serves approximately 19,300 vehicles per day (vpd)[2].

State Route 4 Bypass (Bypass) is a roadway construction project that will replace the existing SR-4 from just south of the Main Street Interchange in the City of Antioch, to the existing intersection with Marsh Creek Road. Phase 1 of the project will be constructed in three segments. Segment 1 extends from just east of the SR-4/Hillcrest Avenue Interchange in the City of Antioch, to Lone Tree Way and will consist of a 6-lane freeway between existing SR4 and the Laurel Road Interchange and a 4-lane freeway from Laurel Road to Lone Tree Way. Phase 1 of Segment 2 has been constructed as a 2-lane Expressway from Lone Tree Way to Balfour Road, and will eventually be converted to a full freeway with interchanges at Sand Creek Road and Balfour Road . Segment 3 will extend from Balfour Road south to Marsh Creek Road as a 2-lane Expressway, then along Marsh Creek Road (East-West Connector) as a 2-lane conventional highway, connecting to existing SR4 (Byron Highway). The southerly limits of the project (now called the Vasco Road Extension) are from Marsh Creek Road to Vasco Road at Walnut Boulevard[3].

Lone Tree Way is an arterial roadway located west of Brentwood Boulevard at the north end of the project area. Lone Tree Way runs north-south from SR-4 in Antioch, to James Donlon Boulevard where it then becomes an east-west roadway until it terminates just east of Brentwood Boulevard. This roadway provides regional connectivity from the project area to the City of Antioch, and is fronted by, and provides direct access to, many commercial land uses. Through the project area, Lone Tree Way accommodates approximately 10,600 vpd[2] is planned for widening to four lanes from O'Hara Avenue to Brentwood Boulevard.

Sand Creek Road is an east-west collector roadway which connects the SR-4 Bypass to the west and Brentwood Boulevard to the east. Sand Creek Road accommodates approximately 7,700 vpd[2] west of Brentwood Boulevard, and has four travel lanes east of Fairview Avenue. Sand Creek Road is planned to be extended east of Brentwood Boulevard to Sellers Avenue. The City has a development agreement in place for the near-term construction of Sand Creek Road from Brentwood Boulevard to Garin Parkway.

Central Boulevard is an east-west collector roadway which extends from west of Fairview Avenue west to Brentwood Boulevard, where it becomes Sycamore Avenue. West of Griffith Lane, Central Boulevard has two travel lanes and between Griffith Lane and Brentwood Boulevard, Central Boulevard has four travel lanes. West of Brentwood Boulevard, Central Avenue provides access to shopping centers, other commercial uses, and a number of neighborhoods.

Other roadways incorporated in this analysis (i.e. Gregory Lane) are local roads that provide connectivity from Brentwood Boulevard to surrounding neighborhoods and/or other portions of the City.

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[2] Kimley-Horn and Associates, Inc., October 29, 2008.
[3] SR4 Bypass Authority Project Information website. Available: http://www.sr4bypass.org/Information/Projectinfo_general.htm

Bicycle and Pedestrian Facilities

The four-lane sections of Brentwood Boulevard, between Central Avenue and Havenwood Avenue, have Class II bike lanes. North of Havenwood Avenue, Brentwood Boulevard is two lanes and generally lacks bike lanes and sidewalks. In such areas, bicyclists and pedestrians must use the shoulder of the roadway, which is paved and varies in width. There are Class II bike lanes on Central Avenue, east of Brentwood Boulevard. The other project area roadways generally lack Class II bike lanes. In addition, Class I bike trails, maintained by East Bay Regional Park District, exist along the Marsh Creek Trail and the East Bay Municipal Utility District's Mokelumne Aqueduct right-of-way.

Transit Facilities

Transit service in the City of Brentwood is provided by Tri-Delta Transit (TDT). Tri Delta Transit currently operates 6 local routes (383, 384, 385, 386, 391 & Dimes-A-Ride), and 2 express commuter routes (300, DX) on weekdays and a single local route (393) on weekends that serve the City of Brentwood. Two of the six local routes are trunk line services that operate on the SR-4/Brentwood Boulevard corridor through Brentwood[6]. Bus routes in the vicinity of the project are illustrated in Figure 4.

ASSESSMENT OF PROPOSED PROJECT

Proposed Project Trip Generation

The number of trips anticipated to be generated by the proposed project were derived using data included in *Trip Generation, 7th Edition*, and the *Trip Generation Handbook, Second Edition*, both published by the Institute of Transportation Engineers (ITE). Where applicable, the regression equation method was utilized for trip generation calculations per the guidelines recommended by ITE[7]. The anticipated trip generation for this project is shown in Table 1.

Table 1 – Proposed Project Trip Generation

ITE Land Use	Size[2]		Total Daily Trips	AM Peak Hour					PM Peak Hour				
				Total Trips	IN		OUT		Total Trips	IN		OUT	
					%	Trips	%	Trips		%	Trips	%	Trips
Apartment	468.0		2,963	233	20%	47	80%	186	275	65%	179	35%	96
Single-Family Detached Housing	148.0		1,491	113	25%	28	75%	85	153	63%	96	37%	56
Shopping Center	107.3		7,108	163	61%	100	39%	64	656	48%	315	52%	341
General Office Building	88.0		1,209	169	88%	149	12%	20	177	17%	30	83%	147
College	228.7		5,489	659	88%	580	12%	79	494	17%	84	83%	410
Subtotal New Trips:			***18,260***	***1,337***		***903***		***434***	***1,755***		***704***		***1,051***
Internal Reduction[1] (Daily, PM)	11.2%	10.3%	-1,436						-129		-64		-66
Pass-By Reduction[1] (LU 820)	34%		-2,417						-223		-107		-116
Alternate Mode Reduction[3]	7%		-1,278	-94		-63		-30	-123		-49		-74
Net New External Trips:			***13,129***	***1,244***		***840***		***404***	***1,280***		***484***		***796***

Source: *Trip Generation, 7th Edition*, ITE.
[1] Based on methodology published in *Trip Generation Handbook, Second Edition*, ITE.
[2] Dwelling units for residential uses and square feet for non-residential uses.
[3] Per the Brentwood Boulevard Specific Plan ADEIR.

As shown in Table 1, the proposed project land uses are estimated to generate 13,129 total new daily trips with 1,244 new trips occurring during the AM peak-hour, and 1,280 new trips occurring during the PM peak-hour.

[6] Email from Tom Harais to Kimley-Horn and Associates, November 20, 2007.
[7] *Trip Generation Handbook, Second Edition*, ITE.

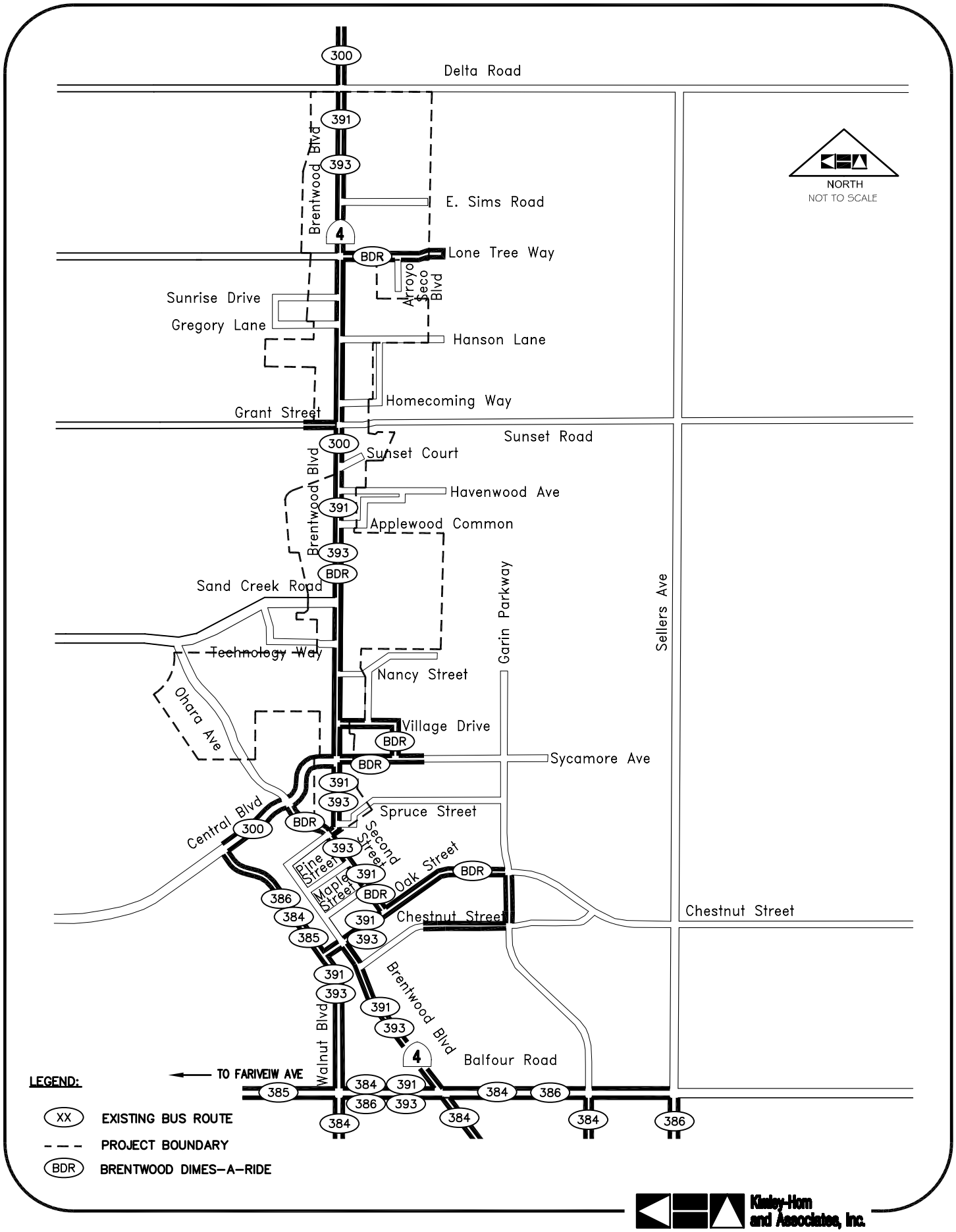

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FIGURE 4

TRANSIT FACILITIES

SCIORTINO RANCH

BRENTWOOD, CA

Proposed Project Trip Distribution

The distribution of project generated traffic for Existing plus Proposed Project Conditions was developed based on traffic data collected in October 2008 and general knowledge of project area traffic patterns. The project trip distribution percentages are assumed to be similar to be similar to those assumed for the Brentwood Boulevard Specific Plan[8] and are illustrated in Figure 5. The resulting AM and PM peak-hour traffic volumes attributed to the proposed project at the study area intersections are illustrated in Figure 6.

Project trips for the Cumulative Plus proposed Project conditions were distributed using future year (2030) output from the CCTA travel demand model. The model employs a methodology that matches trip generators and trip attractors over a wide region, and includes the effects of the SR-4 Bypass and other planned infrastructure improvements.

TRAFFIC IMPACT ANALYSIS METHODOLOGY

Analysis of significant environmental impacts at intersections is based on the concept of Level of Service (LOS). The LOS of a facility is a qualitative measure used to describe operational conditions. LOS ranges from A (best), which represents minimal delay, to F (worst), which represents heavy delay and a facility that is operating at or near its functional capacity.

Contra Costa County Measure C established a sales tax to be used to fund transportation improvements in Contra Costa County. The measure includes a growth management program and requires Contra Costa Transportation Authority (CCTA) to develop a comprehensive transportation plan and update it every other year. To receive a share of the sales tax generated by Measure C, local jurisdictions must adhere to the LOS standards that Measure C applies to local streets and roads. The Measure C standards are applied to streets and roads for which the jurisdictions are responsible. Each jurisdiction must take appropriate action to ensure that the LOS standards are met, including routes of regional significance. Designated regional routes include all the freeways and state highways, and the most significant arterials in Contra Costa County.

The CCTA classifies several roadways within, or near, the project area as routes of "regional significance". These routes include Brentwood Boulevard and Lone Tree Way[9]. As such, intersections along these routes require analysis utilizing Growth Management Program procedures outlined in the CCTA Technical Procedures, dated July 19, 2006. The CCTA Technical Procedures require the analysis of intersections based on the Intersection Capacity Utilization (ICU) methodology. The ICU methodology describes the operation of an intersection in terms of Level of Service (LOS) based on corresponding volume to capacity (v/c) ratio. Based on City of Brentwood and CCTA requirements, this traffic analysis was completed using the CCTALOS module at signalized intersections, and the *Highway Capacity Manual* (HCM) module within Traffix® at unsignalized intersections. Table 2 presents LOS definitions for signalized intersection as defined by the ICU methodology.

Table 2 presents LOS for unsignalized intersections as defined by the HCM.

Roadway segment LOS definitions for two-lane and multilane highways are based on the HCM. Table 3 and presents the applicable roadway segment LOS definitions for two-lane and multilane highway facilities.

[8] Kimley-Horn and Associates, Inc. *Traffic Impact Analysis, Brentwood Boulevard Specific Plan, Final Report*, April 14, 2008.
[9] Contra Costa Transportation Authority. *East County Action Plan*, June 29, 2000.

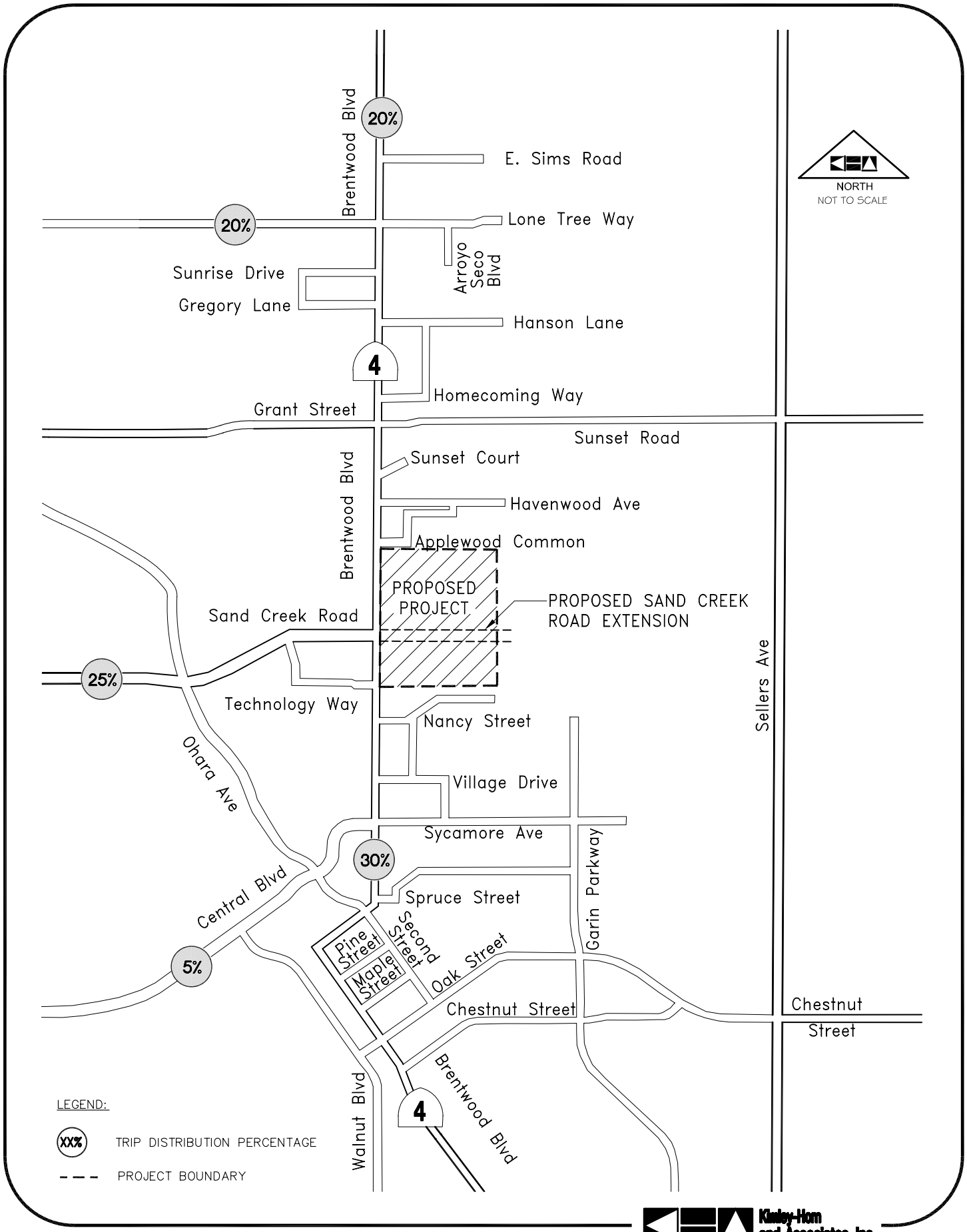

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FIGURE 5

PROPOSED PROJECT TRIP DISTRIBUTION

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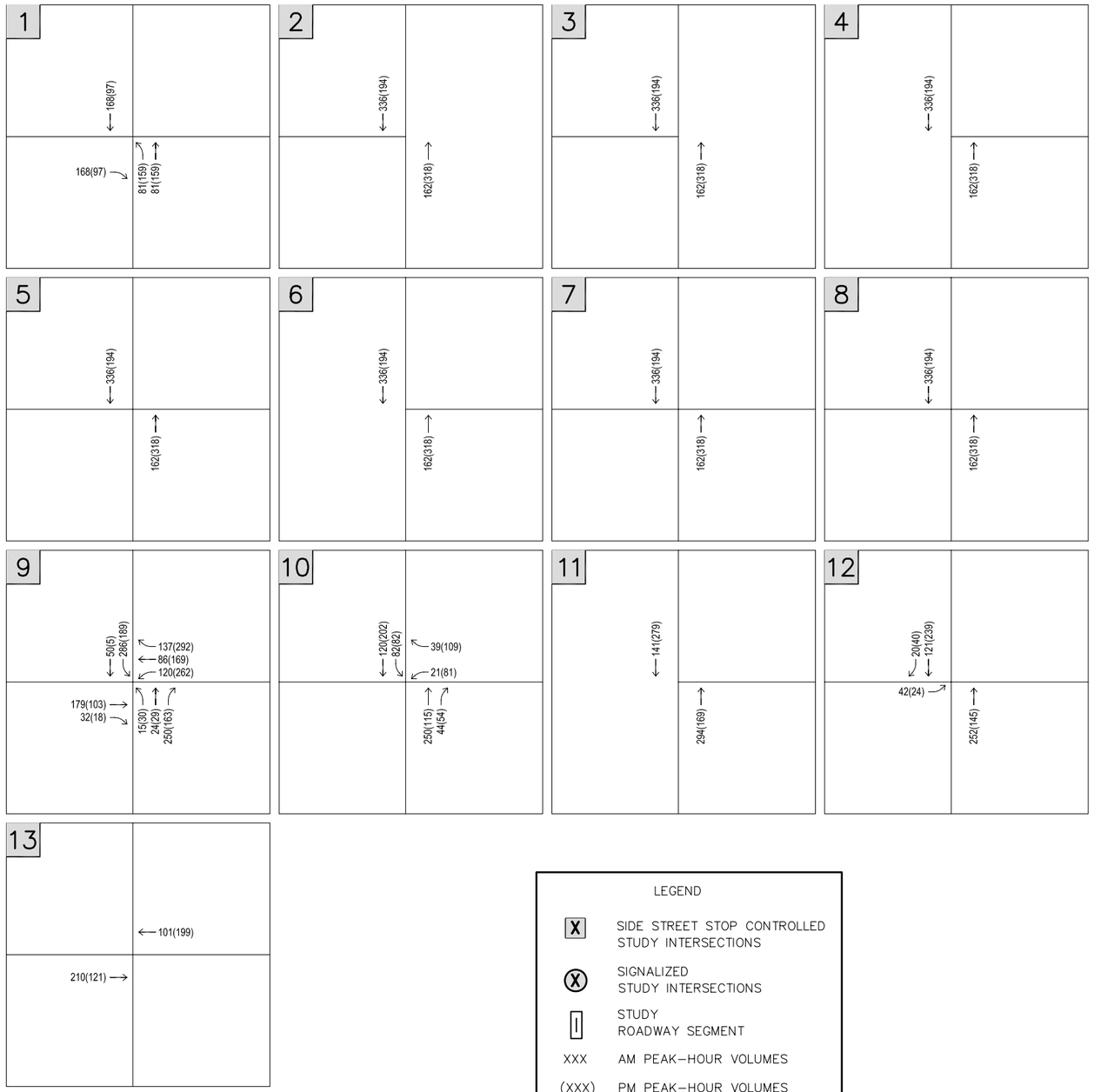
BRENTWOOD, CA



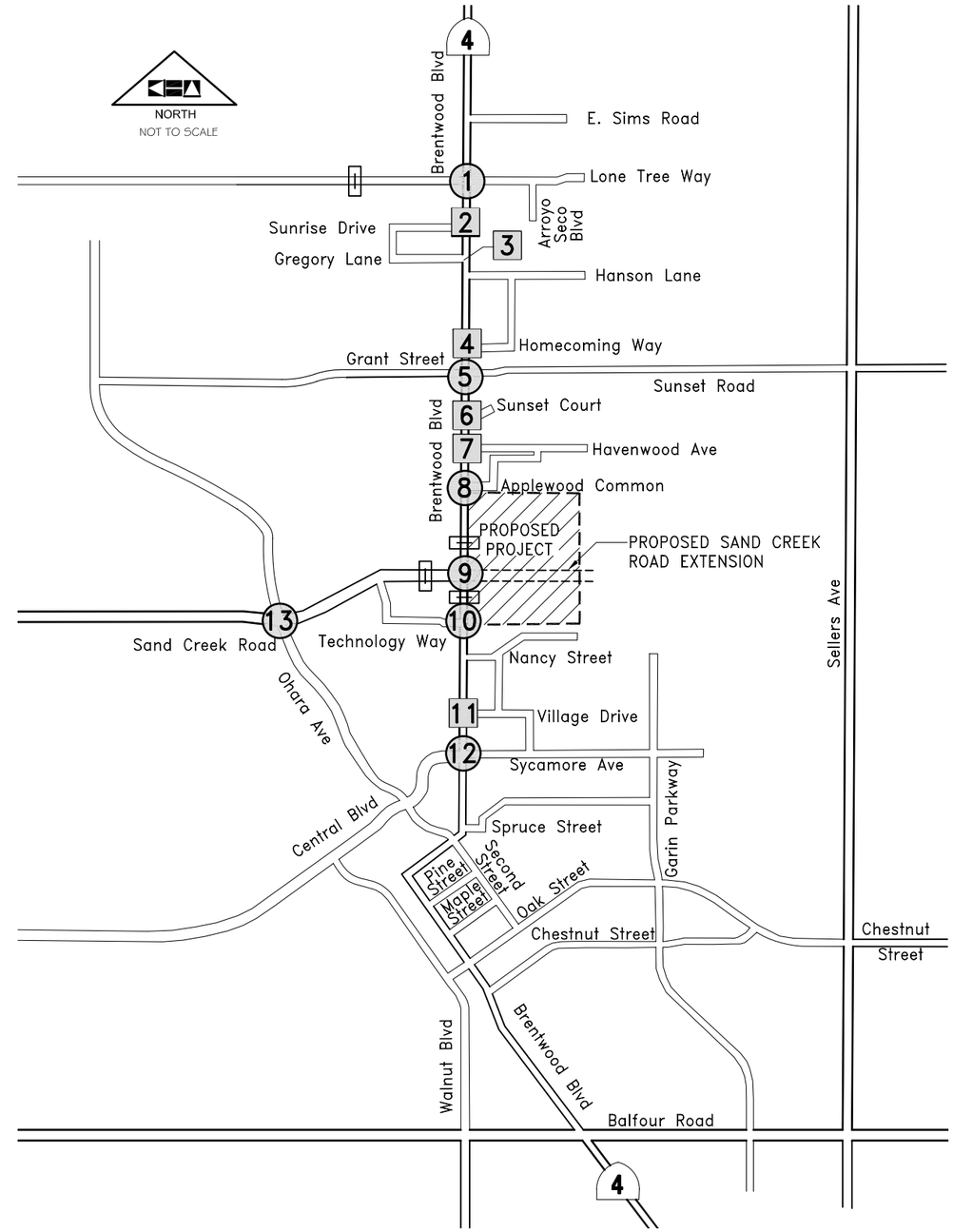


FIGURE 6

PROPOSED PROJECT TRIP ASSIGNMENT

SCIORTINO RANCH
BRENTWOOD, CA

Peak-hour traffic signal warrant evaluation is consistent with the peak-hour volume warrant (Warrant 3B) methodologies noted in Section 4C of the *California Manual on Uniform Traffic Control Devices (CMUTCD)*, September 26, 2006.

The LOS analysis was conducted for the study intersections and roadway segments for weekday AM and PM peak-hours for the following scenarios:

A. Existing (2008) Conditions
B. Existing plus Approved Projects Conditions
C. Existing plus Approved Projects plus Proposed Project Conditions
D. Cumulative (2030) Conditions
E. Cumulative plus Proposed Project Conditions

Table 2 – Intersection Level of Service Criteria

Level of Service	**Description**	**Signalized** (Intersection Volume to Capacity ratio, v/c)	**Unsignalized** (Average Control Delay per Vehicle, sec/veh)
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream	≤ 0.6	≤ 10
B	Stable traffic. Traffic flows smoothly with few delays.	0.61 – 0.70	> 10 – 15
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	0.71 – 0.80	> 15 – 25
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.	0.81 – 0.90	> 25 – 35
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	0.91 – 1.00	> 35 – 50
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	> 1.00	> 50
Sources: *Contra Costa Transportation Authority Technical Procedures 2006 and Transportation Research Board, Highway Capacity Manual 2000*, National Research Council, 2000.			

Table 3 –Roadway Segment Level of Service Criteria

Facility Type	**Percent Time-Spent-Following (PTSF) – 2-Lane Passenger Cars per Hour per Lane (pc/hr/ln) – Mutilane**				
	A	**B**	**C**	**D**	**E**
2-Lane, Class II Highway	≤ 40	>40-55	>55-70	>70-85	>85
Multilane Highway	490	810	1170	1550	1900
Source: Highway Capacity Manual, 2000					

EXISTING (2008) CONDITIONS

Analysis of existing traffic conditions at the study intersections was based on peak-hour traffic counts conducted in October 2008. Local schools were in session during the week that the data was collected. The weekday AM and PM peak-hour intersection turning movement traffic counts were conducted between the hours of 7 a.m. and 9 a.m., and 4 p.m. and 6 p.m., respectively. The existing peak-hour turn movement volumes and roadway segment volumes are presented in Figure 7. Traffic count sheets are presented in Appendix A and the analysis worksheets for this scenario are provided in Appendix B.

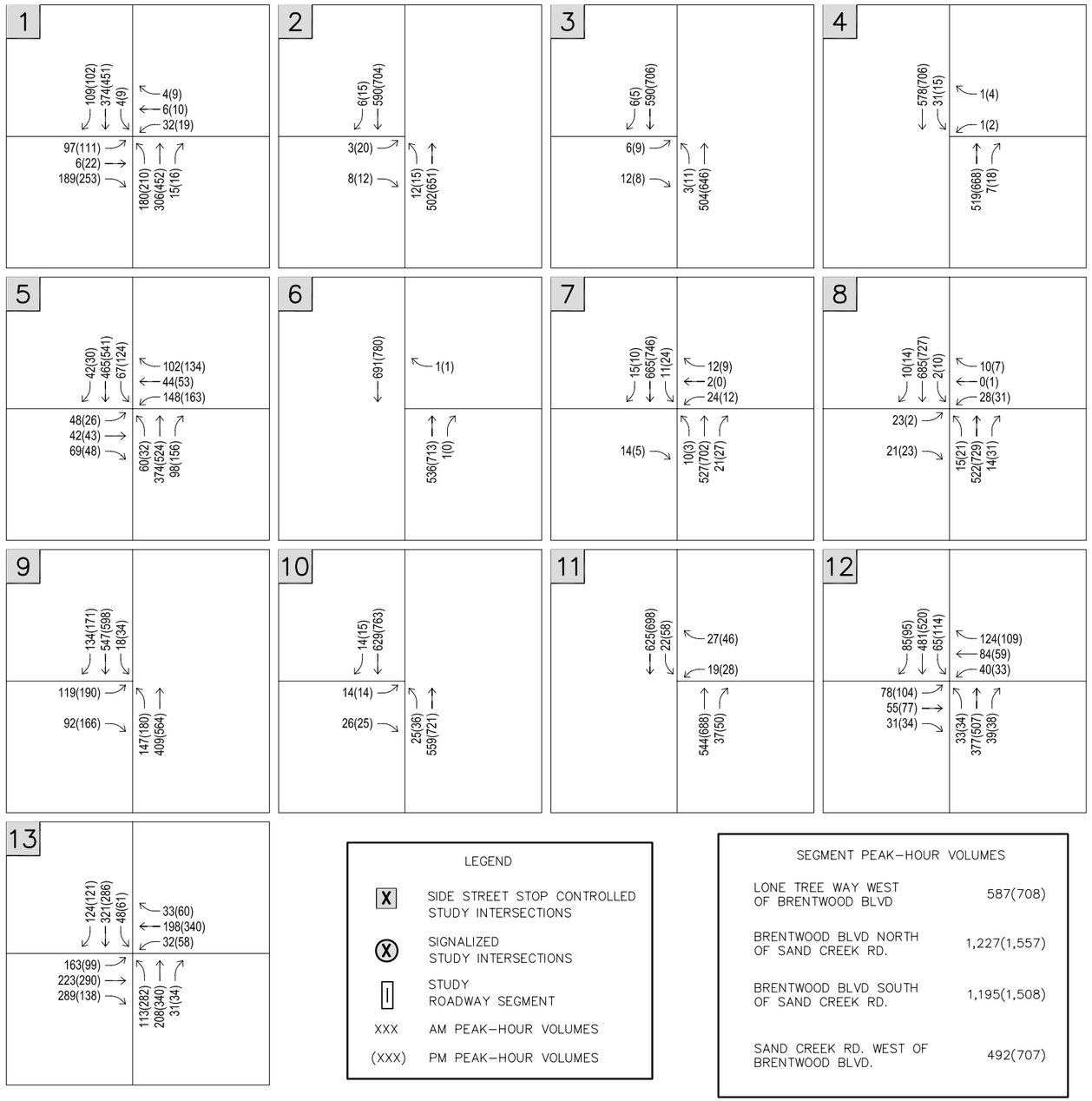
Intersections

Table 4 presents the existing peak-hour intersection operating conditions and signal warrants for the study intersections. As indicated in Table 4, the study intersections operate from LOS A to LOS D during the AM and PM peak-hours.

Table 4 – Existing (2008) Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec.) or V/C ratio*	LOS	Delay (sec.) or V/C ratio*	LOS	
1	Brentwood Blvd. @ Lone Tree Wy.	Signal	0.341	A	0.378	A	N/A
2	Brentwood Blvd. @ Sunrise Dr.	Side Street Stop	12.3	B	14.2	B	NO
3	Brentwood Blvd. @ Gregory Ln.	Side Street Stop	12.4	B	13.7	B	NO
4	Brentwood Blvd. @ Homecoming Wy.	Side Street Stop	16.8	C	18.5	C	NO
5	Brentwood Blvd. @ Grant St./Sunset Rd.	Signal	0.527	A	0.579	A	N/A
6	Brentwood Blvd. @ Sunset Ct.	Side Street Stop	11.6	B	13.3	B	NO
7	Brentwood Blvd. @ Havenwood Ave.	Side Street Stop	19.1	C	21.6	C	NO
8	Brentwood Blvd. @ Applewood Common	Signal	0.239	A	0.258	A	N/A
9	Brentwood Blvd. @ Sand Creek Rd.	Signal	0.353	A	0.439	A	N/A
10	Brentwood Blvd. @ Technology Wy.	Signal	0.225	A	0.270	A	N/A
11	Brentwood Blvd. @ Village Dr.	Side Street Stop	14.5	B	19.5	C	NO
12	Brentwood Blvd. @ Central Blvd./Sycamore Ave.	Signal	0.290	A	0.333	A	N/A
13	Sand Creek Rd. @ O'Hara Ave.	Signal	0.314	A	0.421	A	N/A

* Control delay for worst minor approach (worst minor movement) for TWSC.
1. Per the California Manual on Uniform Traffic Control Devices (CMUTCD), September 26, 2006, Section 4C.



LEGEND

X	SIDE STREET STOP CONTROLLED STUDY INTERSECTIONS
(X)	SIGNALIZED STUDY INTERSECTIONS
I	STUDY ROADWAY SEGMENT
XXX	AM PEAK-HOUR VOLUMES
(XXX)	PM PEAK-HOUR VOLUMES

SEGMENT PEAK-HOUR VOLUMES

LONE TREE WAY WEST OF BRENTWOOD BLVD	587(708)
BRENTWOOD BLVD NORTH OF SAND CREEK RD.	1,227(1,557)
BRENTWOOD BLVD SOUTH OF SAND CREEK RD.	1,195(1,508)
SAND CREEK RD. WEST OF BRENTWOOD BLVD.	492(707)

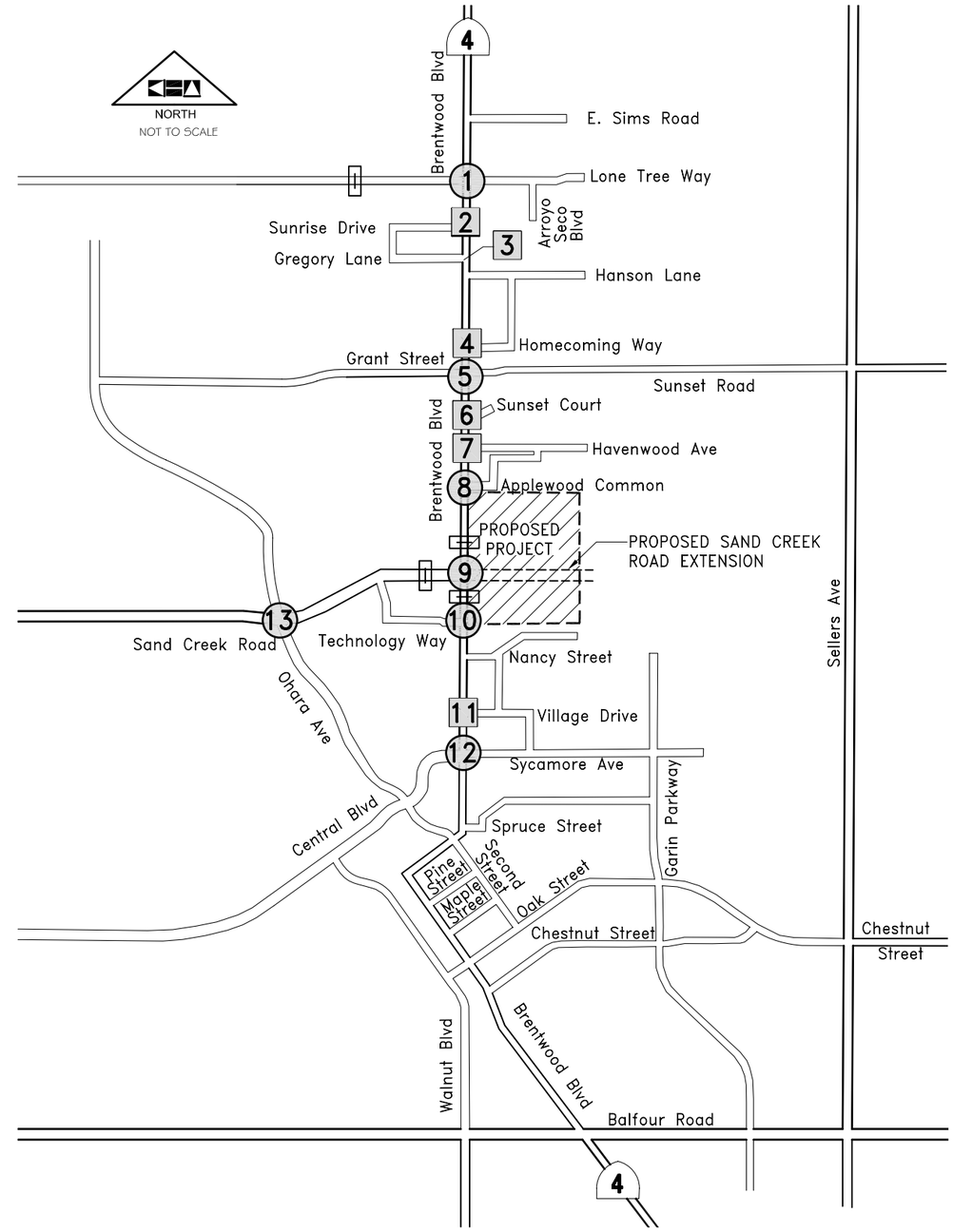


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FIGURE 7

EXISTING (2008) PEAK-HOUR TRAFFIC VOLUMES

SCIORTINO RANCH
BRENTWOOD, CA

Roadway Segments

Table 5 presents the existing roadway segment levels of service for the study roadway segments. As indicated in Table 5, the roadway segments operate from LOS A to LOS C.

Table 5 – Existing (2008) Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS	PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.**	Collector	2	62.7%	C	65.1%	C
2	Brentwood Blvd. north of Sand Creek Rd.*	Arterial	4	294 / 390	A / A	425 / 453	A / A
3	Brentwood Blvd. south of Sand Creek Rd.*	Arterial	4	300 / 345	A / A	429 / 440	A / A
4	Sand Creek Rd. west of Brentwood Blvd.**	Arterial	4	125 / 167	A / A	205 / 202	A / A

Source: *Highway Capacity Manual, 2000.*

[1] PTSF = Percent Time Spent Following, pc/hr/ln = passenger cars per hour per lane.

* Results for this roadway segment are presented in **NB / SB** format (where applicable).

** Results for this roadway segment are presented in **EB / WB** format (where applicable).

EXISTING PLUS APPROVED PROJECTS CONDITIONS

Peak-hour traffic associated with several development projects in the vicinity of the proposed project was added to the existing traffic volumes. These projects, which are in various stages of planning or development, are assumed to be developed and fully occupied prior to implementation of the Proposed Project. Project information for all approved projects to be included in this analysis was provided by the City[10].

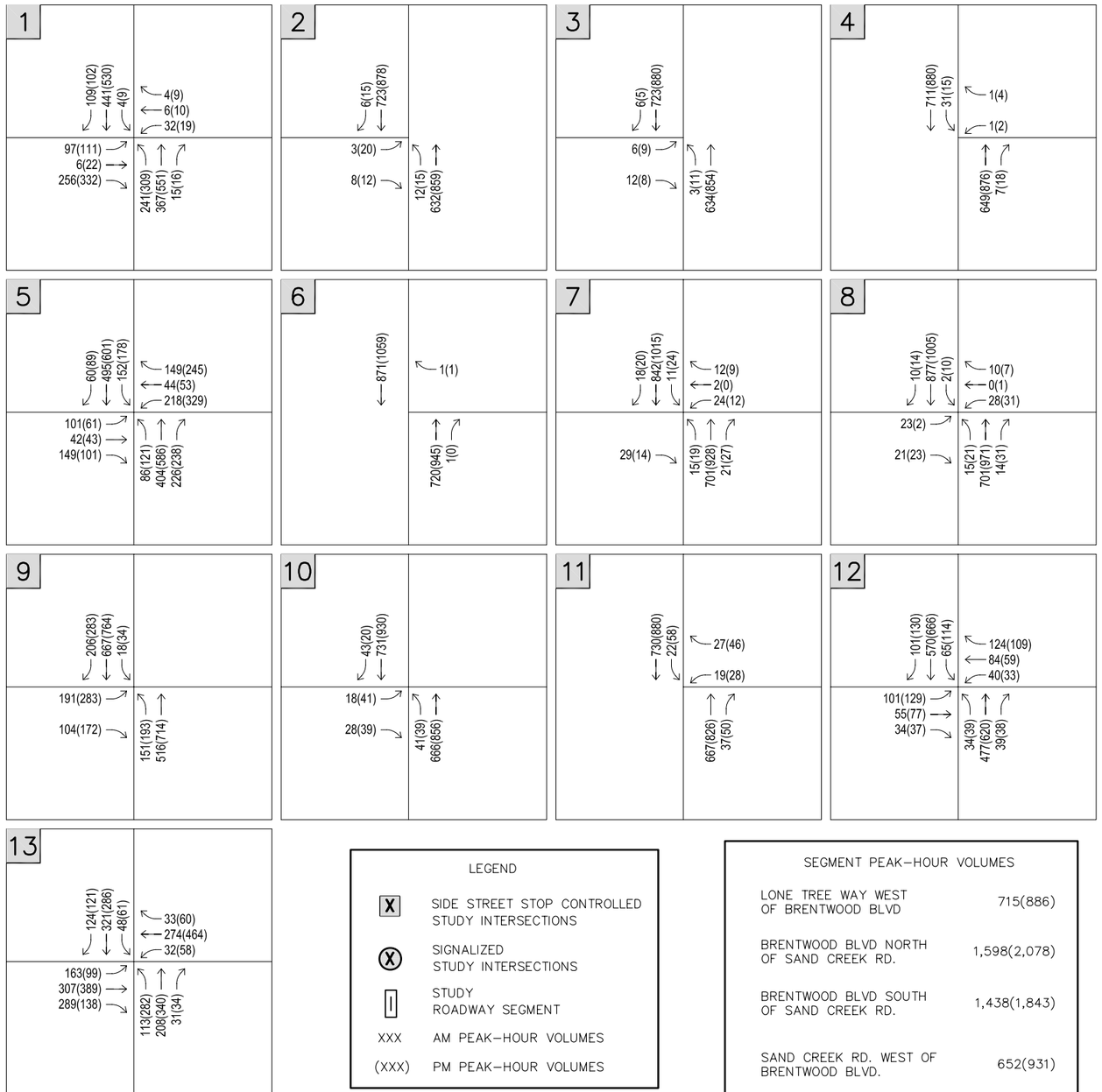
A summary of pending or approved projects that were determined to contribute traffic to the study facilities is provided in Table 6.

Table 6 – Pending and Approved Projects

Project Name	Land Use Type	Size
Towncentre Commons	Residential	16 Multi-family
Magnolia	Residential	34 Single Family
Prewett Builders	Residential	240 Single Family
Delta Fence	Industrial	25,916 Sq. Ft.
Brentwood Center II	Retail	8,800 Sq. Ft.
Pizzagoni Towing	Industrial	67,458 Sq. Ft.
Office Condo Buildings	Office	37,776 Sq. Ft.
Solid Waste Transfer Station	Industrial	32,962 Sq. Ft.
Kendall Plaza	Mixed-Use	4,400 Sq. Ft. Retail, 7,110 Sq. Ft. Office 17,592 Sq. Ft. Industrial

Figure 8 provides the AM and PM peak-hour traffic volumes at the study intersections and roadway segment volumes for this analysis scenario. Analysis worksheets for this scenario are provided in Appendix C.

[10] City of Brentwood Project Status Report, February 8, 2007.



LEGEND

X	SIDE STREET STOP CONTROLLED STUDY INTERSECTIONS
(X)	SIGNALIZED STUDY INTERSECTIONS
I	STUDY ROADWAY SEGMENT
XXX	AM PEAK-HOUR VOLUMES
(XXX)	PM PEAK-HOUR VOLUMES

SEGMENT PEAK-HOUR VOLUMES

LONE TREE WAY WEST OF BRENTWOOD BLVD	715(886)
BRENTWOOD BLVD NORTH OF SAND CREEK RD.	1,598(2,078)
BRENTWOOD BLVD SOUTH OF SAND CREEK RD.	1,438(1,843)
SAND CREEK RD. WEST OF BRENTWOOD BLVD.	652(931)

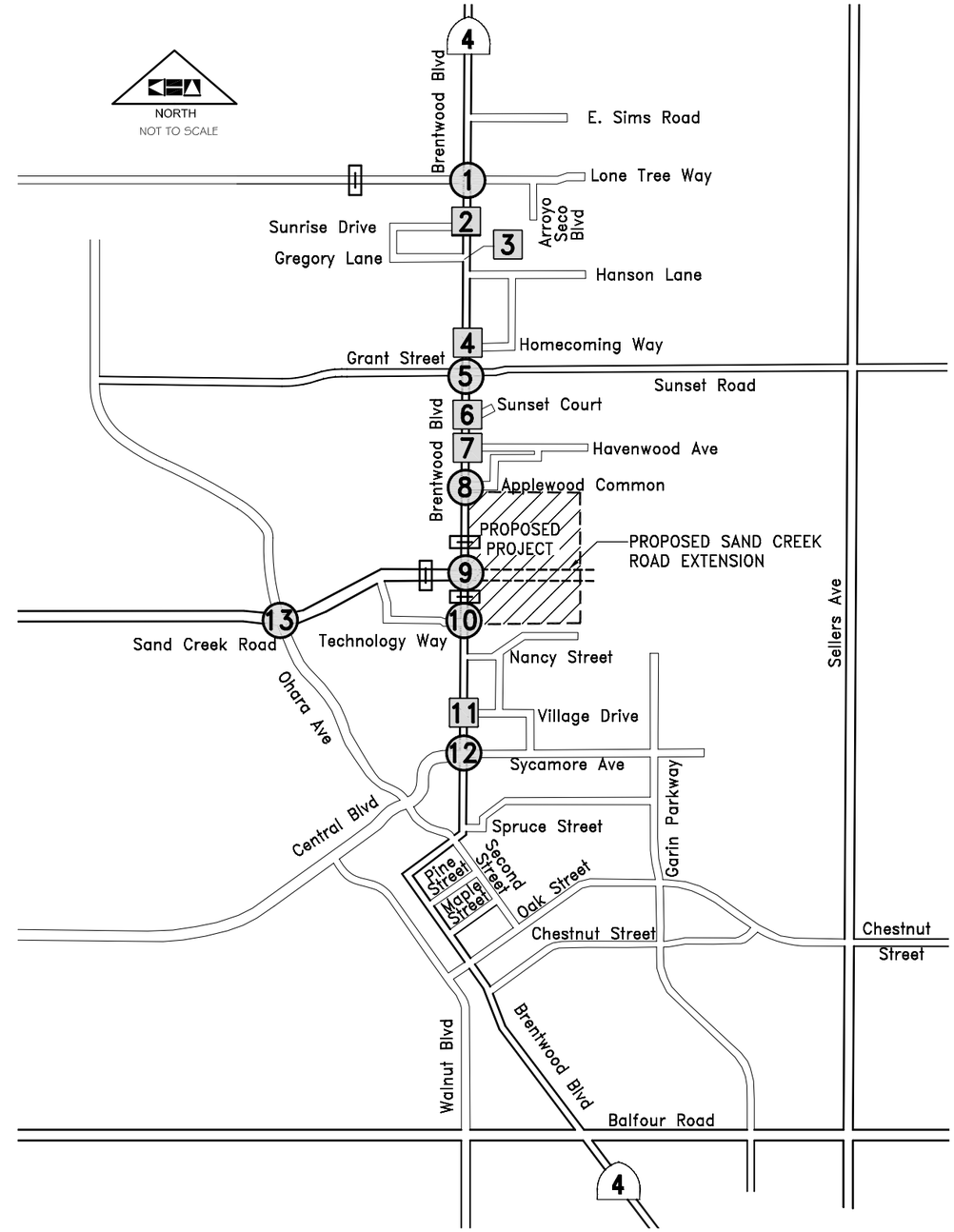


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FIGURE 8

EXISTING PLUS APPROVED PROJECTS PEAK-HOUR TRAFFIC VOLUMES

SCIORTINO RANCH
BRENTWOOD, CA

Intersections

Table 7 presents the peak-hour intersection operating conditions and signal warrants for the study intersections. As indicated in Table 7, the study intersections operate from LOS A to LOS F during the AM and PM peak- hours.

Table 7 – Existing plus Approved Projects Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec.) or V/C ratio*	LOS	Delay (sec.) or V/C ratio*	LOS	
1	Brentwood Blvd. @ Lone Tree Wy.	Signal	0.398	A	0.477	A	N/A
2	Brentwood Blvd. @ Sunrise Dr.	Side Street Stop	13.7	B	16.8	C	NO
3	Brentwood Blvd. @ Gregory Ln.	Side Street Stop	13.8	B	16.1	C	NO
4	Brentwood Blvd. @ Homecoming Wy.	Side Street Stop	21.2	C	26.3	D	NO
5	Brentwood Blvd. @ Grant St./Sunset Rd.	Signal	0.663	B	0.810	D	N/A
6	Brentwood Blvd. @ Sunset Ct.	Side Street Stop	13.4	B	16.3	C	NO
7	Brentwood Blvd. @ Havenwood Ave.	Side Street Stop	28.9	D	37.8	E	NO
8	Brentwood Blvd. @ Applewood Common	Signal	0.295	A	0.340	A	N/A
9	Brentwood Blvd. @ Sand Creek Rd.	Signal	0.453	A	0.581	A	N/A
10	Brentwood Blvd. @ Technology Wy.	Signal	0.276	A	0.345	A	N/A
11	Brentwood Blvd. @ Village Dr.	Side Street Stop	17.0	C	26.2	D	NO
12	Brentwood Blvd. @ Central Blvd./Sycamore Ave.	Signal	0.336	A	0.379	A	N/A
13	Sand Creek Rd. @ O'Hara Ave.	Signal	0.337	A	0.458	A	N/A

* Control delay for worst minor approach (worst minor movement) for TWSC.
1. Per the California Manual on Uniform Traffic Control Devices (CMUTCD), September 26, 2006, Section 4C.

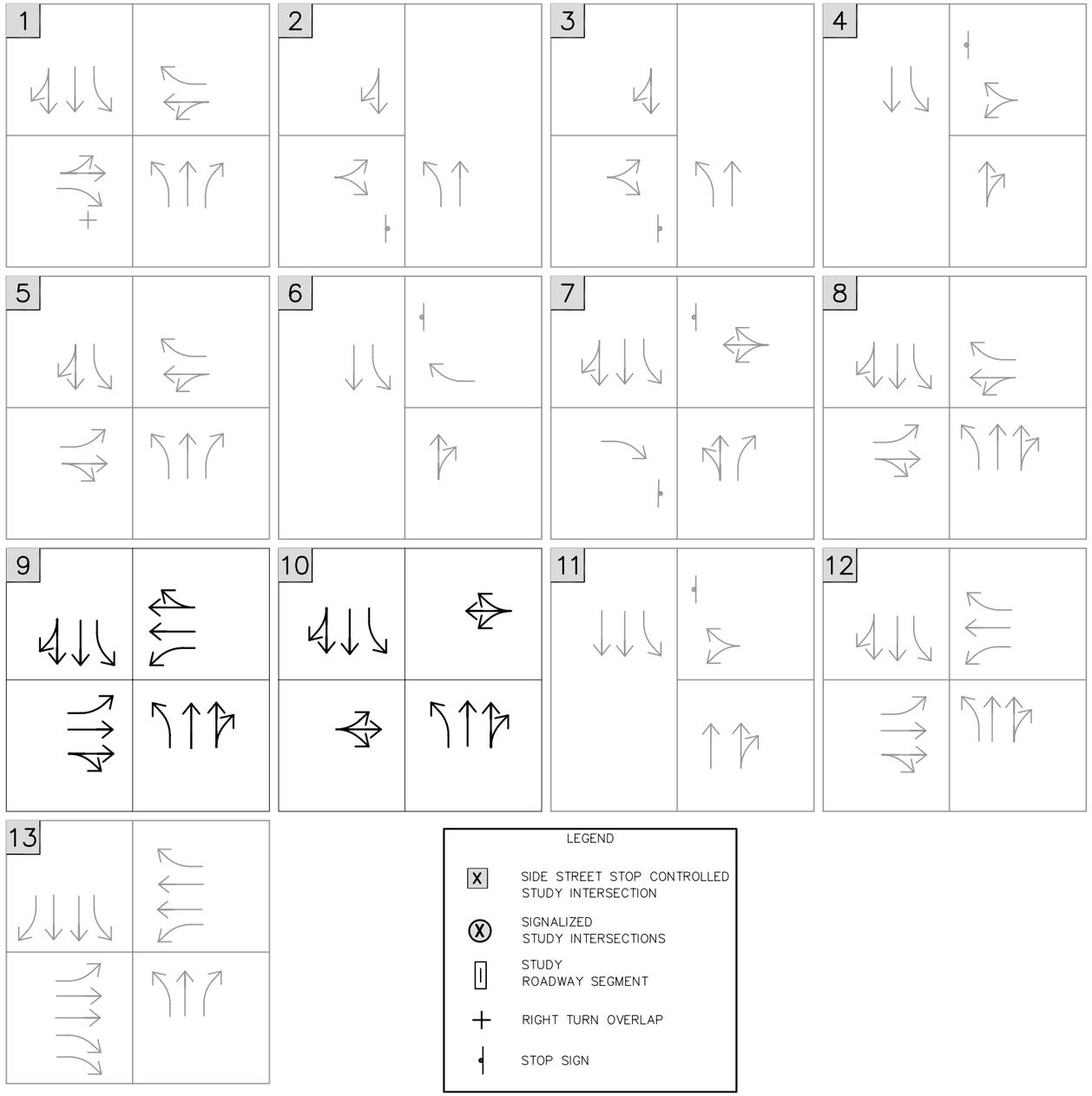
Roadway Segments

Table 8 presents the roadway segment levels of service for the study roadway segments. As indicated in Table 8, the roadway segments operate at LOS A to LOS D.

EXISTING PLUS APPROVED PROJECTS PLUS PROPOSED PROJECT CONDITIONS

Adding the proposed project to the street network results in a change in intersection lane geometry several locations. These geometric changes are shown in Figure 9. Traffic associated with the proposed project was added to the Existing plus Approved Projects traffic volumes to establish the Existing plus Approved Projects plus Proposed Project traffic conditions. Traffic volumes for this scenario are presented in Figure 10.

Analysis worksheets for this scenario are provided in Appendix D.



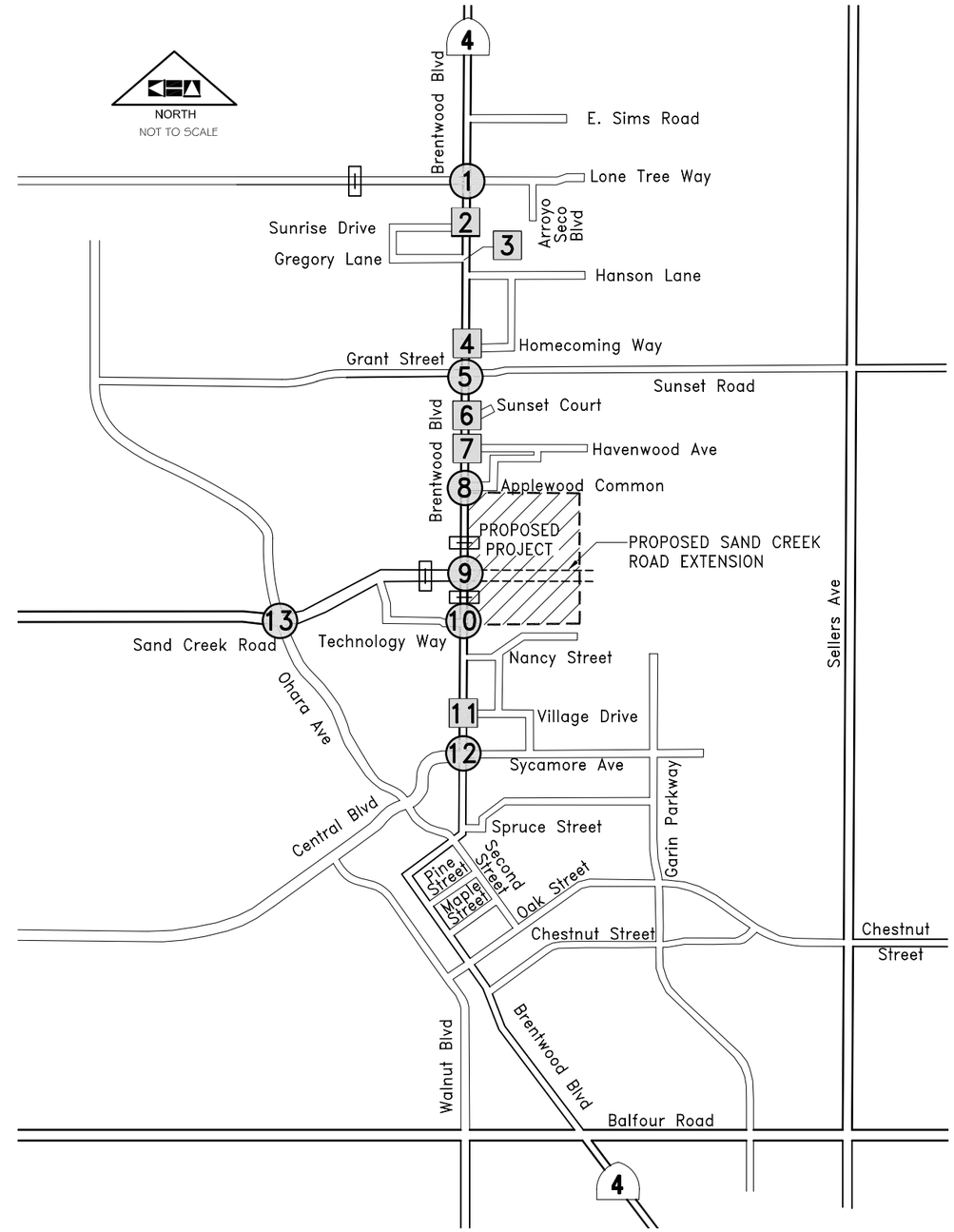
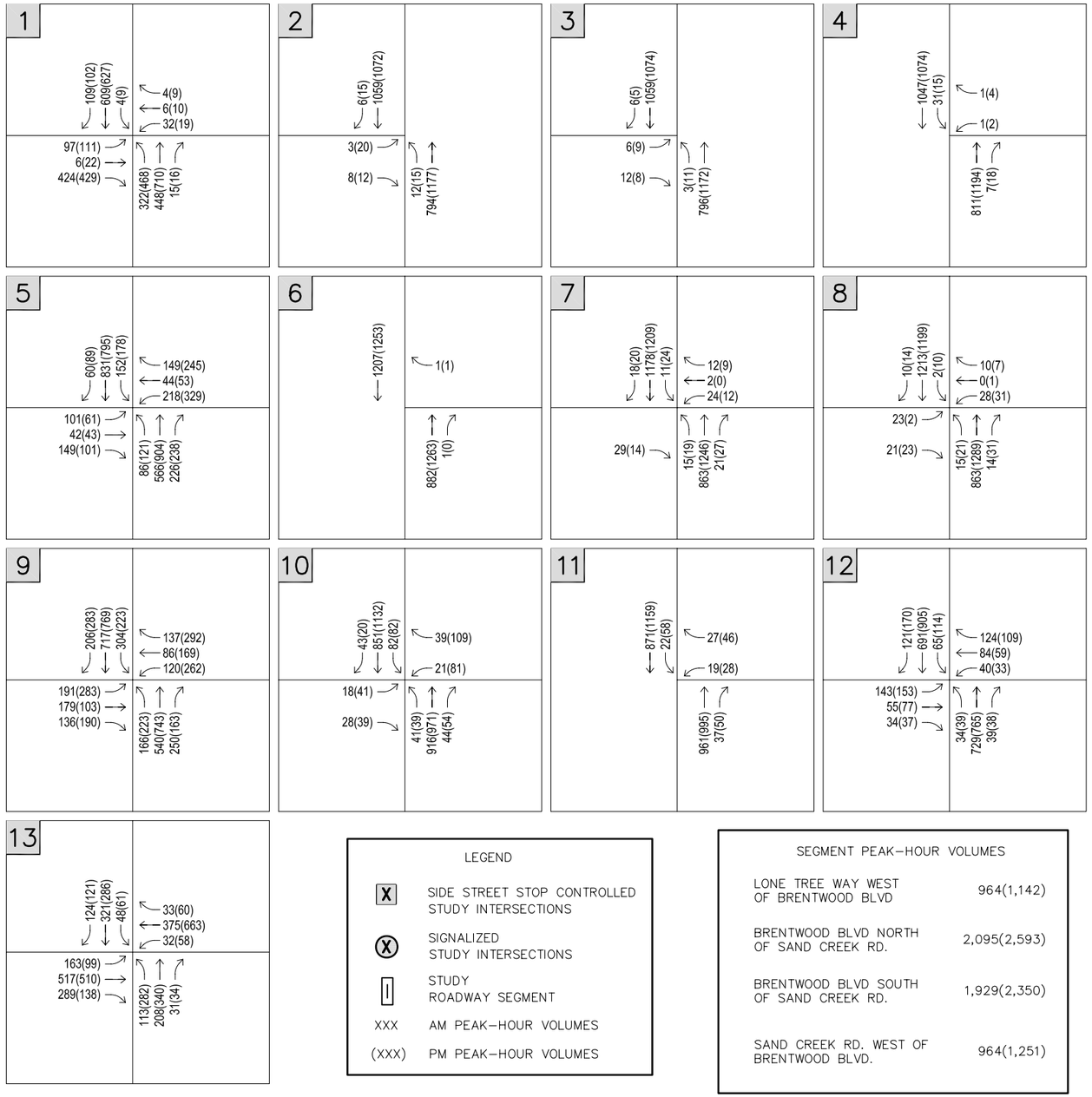


FIGURE 9

EXISTING PLUS APPROVED PROJECTS PLUS PROPOSED PROJECTS INTERSECTION GEOMETRY AND TRAFFIC CONTROL

SCIORTINO RANCH
BRENTWOOD, CA

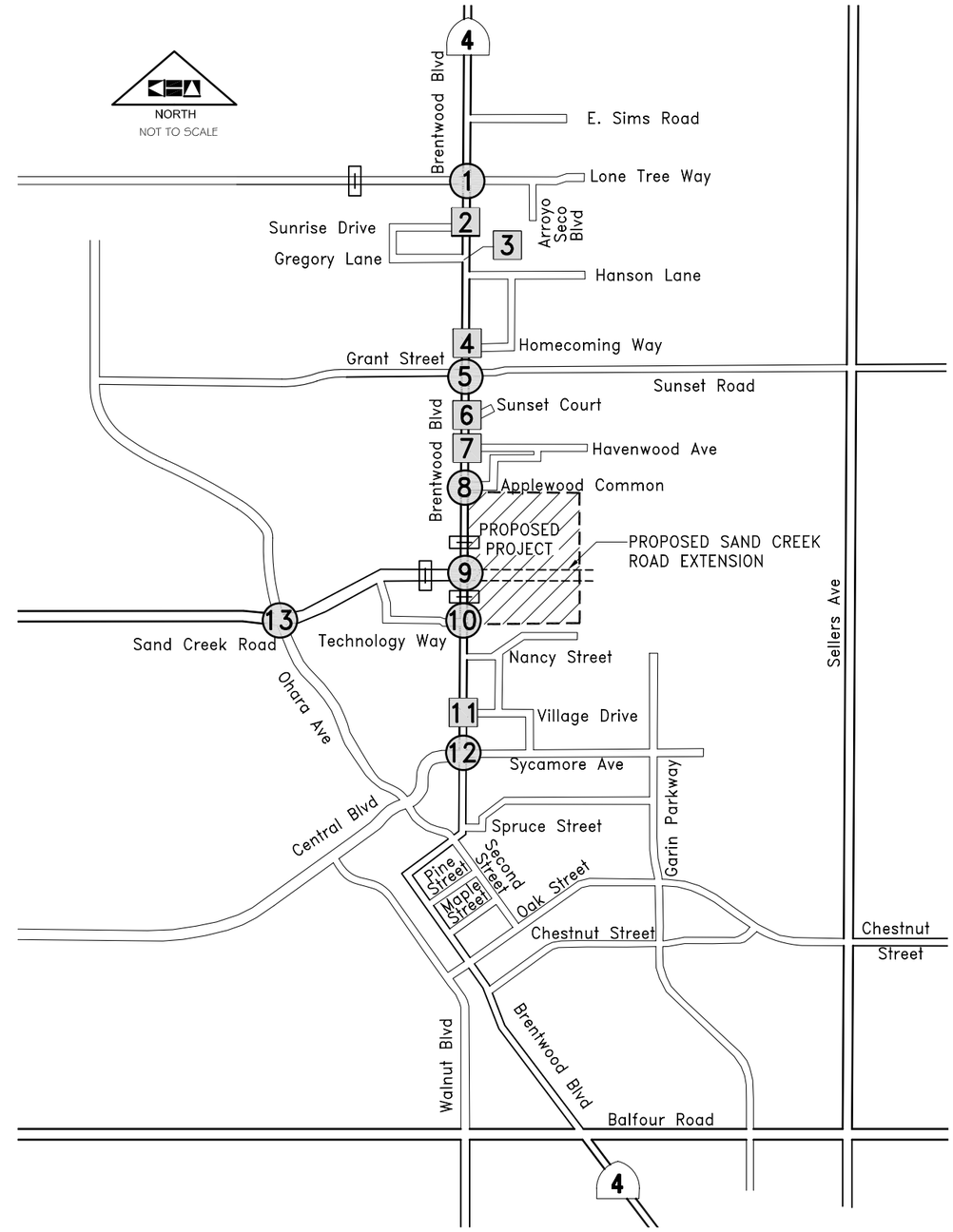


LEGEND

X	SIDE STREET STOP CONTROLLED STUDY INTERSECTIONS
(X)	SIGNALIZED STUDY INTERSECTIONS
I	STUDY ROADWAY SEGMENT
XXX	AM PEAK-HOUR VOLUMES
(XXX)	PM PEAK-HOUR VOLUMES

SEGMENT PEAK-HOUR VOLUMES

LONE TREE WAY WEST OF BRENTWOOD BLVD	964(1,142)
BRENTWOOD BLVD NORTH OF SAND CREEK RD.	2,095(2,593)
BRENTWOOD BLVD SOUTH OF SAND CREEK RD.	1,929(2,350)
SAND CREEK RD. WEST OF BRENTWOOD BLVD.	964(1,251)



Kimley-Horn and Associates, Inc.

FIGURE 10

EXISTING PLUS APPROVED PROJECTS PLUS PROPOSED PROJECT PEAK-HOUR TRAFFIC VOLUMES

SCIORTINO RANCH
BRENTWOOD, CA

Table 8 – Existing plus Approved Projects Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS	PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.**	Collector	2	65.7%	C	70.7%	D
2	Brentwood Blvd. north of Sand Creek Rd.*	Arterial	4	394 / 497	A / B	562 / 610	B / B
3	Brentwood Blvd. south of Sand Creek Rd.*	Arterial	4	361 / 417	A / A	523 / 539	B / B
4	Sand Creek Rd. west of Brentwood Blvd.**	Arterial	4	175 / 212	A / A	262 / 274	A / A

Source: *Highway Capacity Manual, 2000.*
[1] PTSF = Percent Time Spent Following, pc/hr/ln = passenger cars per hour per lane.
* Results for this roadway segment are presented in **NB / SB** format (where applicable).
** Results for this roadway segment are presented in **EB / WB** format (where applicable).

Intersections

Table 9 presents the peak-hour intersection operating conditions for the study intersections. As indicated in Table 9, the study intersections operate from LOS A to LOS F during the AM and PM peak- hours.

Table 9 – Existing plus Approved Projects plus Proposed Project Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec.) or V/C ratio*	LOS	Delay (sec.) or V/C ratio*	LOS	
1	Brentwood Blvd. @ Lone Tree Wy.	Signal	0.498	A	0.603	B	N/A
2	Brentwood Blvd. @ Sunrise Dr.	Side Street Stop	18.3	C	21.4	C	NO
3	Brentwood Blvd. @ Gregory Ln.	Side Street Stop	18.5	C	20.0	C	NO
4	Brentwood Blvd. @ Homecoming Wy.	Side Street Stop	35.1	E	47.0	E	NO
5	Brentwood Blvd. @ Grant St./Sunset Rd.	Signal	0.867	D	0.975	E	N/A
6	Brentwood Blvd. @ Sunset Ct.	Side Street Stop	15.4	C	22.3	C	NO
7	Brentwood Blvd. @ Havenwood Ave.	Side Street Stop	53.4	F	79.7	F	NO
8	Brentwood Blvd. @ Applewood Common	Signal	0.393	A	0.421	A	N/A
9	Brentwood Blvd. @ Sand Creek Rd.	Signal	0.622	B	0.802	D	N/A
10	Brentwood Blvd. @ Technology Wy.	Signal	0.405	A	0.536	A	N/A
11	Brentwood Blvd. @ Village Dr.	Side Street Stop	25.9	D	44.2	E	NO
12	Brentwood Blvd. @ Central Blvd./Sycamore Ave.	Signal	0.404	A	0.478	A	N/A
13	Sand Creek Rd. @ O'Hara Ave.	Signal	0.368	A	0.518	A	N/A

Shaded Cells indicate significant impact
* Control delay for worst minor approach (worst minor movement) for TWSC.
1. Per the California Manual on Uniform Traffic Control Devices (CMUTCD), September 26, 2006, Section 4C.

Roadway Segments
Table 10 presents the roadway segment levels of service for the study roadway segments. As indicated in Table 10, the roadway segments operate at LOS A to LOS D.

Table 10 – Existing plus Approved Projects plus Proposed Project Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS	PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.**	Collector	2	72.5%	D	76.5%	D
2	Brentwood Blvd. north of Sand Creek Rd.*	Arterial	4	485 / 685	A / B	743 / 719	B / B
3	Brentwood Blvd. south of Sand Creek Rd.*	Arterial	4	517 / 526	B / B	651 / 704	B / B
4	Sand Creek Rd. west of Brentwood Blvd.**	Arterial	4	301 / 273	A / A	332 / 389	A / A

Source: *Highway Capacity Manual, 2000* .
Shaded cells indicate significant impact.
[1] PTSF = Percent Time Spent Following, pc/hr/ln = passenger cars per hour per lane.
* Results for this roadway segment are presented in **NB / SB** format (where applicable).
** Results for this roadway segment are presented in **EB / WB** format (where applicable).

CUMULATIVE (2030) CONDITIONS

Year 2030 AM and PM peak-hour roadway segment traffic volumes were obtained from the Brentwood Boulevard Specific Plan[12]. Those volumes assume the Specific Plan land uses are incorporated into the CCTA Regional Travel Demand model. The model estimates vehicle traffic expected for build-out of the land uses designated in the General Plan. The model then assigns those traffic volumes to various roadway facilities anticipated to be in place prior to the year for which traffic is being forecasted. The SR-4 Bypass is assumed to be in place under cumulative conditions. To establish Cumulative (no project) conditions, trips from land uses assumed for the project site in the Brentwood Boulevard Specific Plan were deducted from the network. The resulting volumes were then adjusted to not be less than the Existing Plus Approved Project conditions. Analysis worksheets for this scenario are provided in Appendix E.

The City's General Plan[13] designates a number of improvements for the project area as noted below. It is assumed the following improvements will be implemented over time with the implementation of the General Plan.

- Widen Brentwood Boulevard to 4-lanes
- Sand Creek Road east from Brentwood to Sellers Avenue.

Existing turning movement percentages were used to establish turning movement volumes for Cumulative traffic conditions. In some cases, the use of existing turning movement percentages were not deemed appropriate due to anticipated roadway network changes. In such cases, traffic volumes were adjusted to reflect the probable effects on the circulation patterns in the vicinity of the proposed project. Traffic volumes for this scenario are presented in Figure 11.

[12] *Traffic Impact Analysis, Brentwood Boulevard Specific Plan, Final Report*, Kimley-Horn and Associates, Inc. April 14, 2008.
[13] *City of Brentwood General Plan, 2001-2021*, November 2001.

Intersections

presents the peak-hour intersection operating conditions for the study intersections. As indicated in , the study intersections operate from LOS A to LOS F during the AM and PM peak- hours.

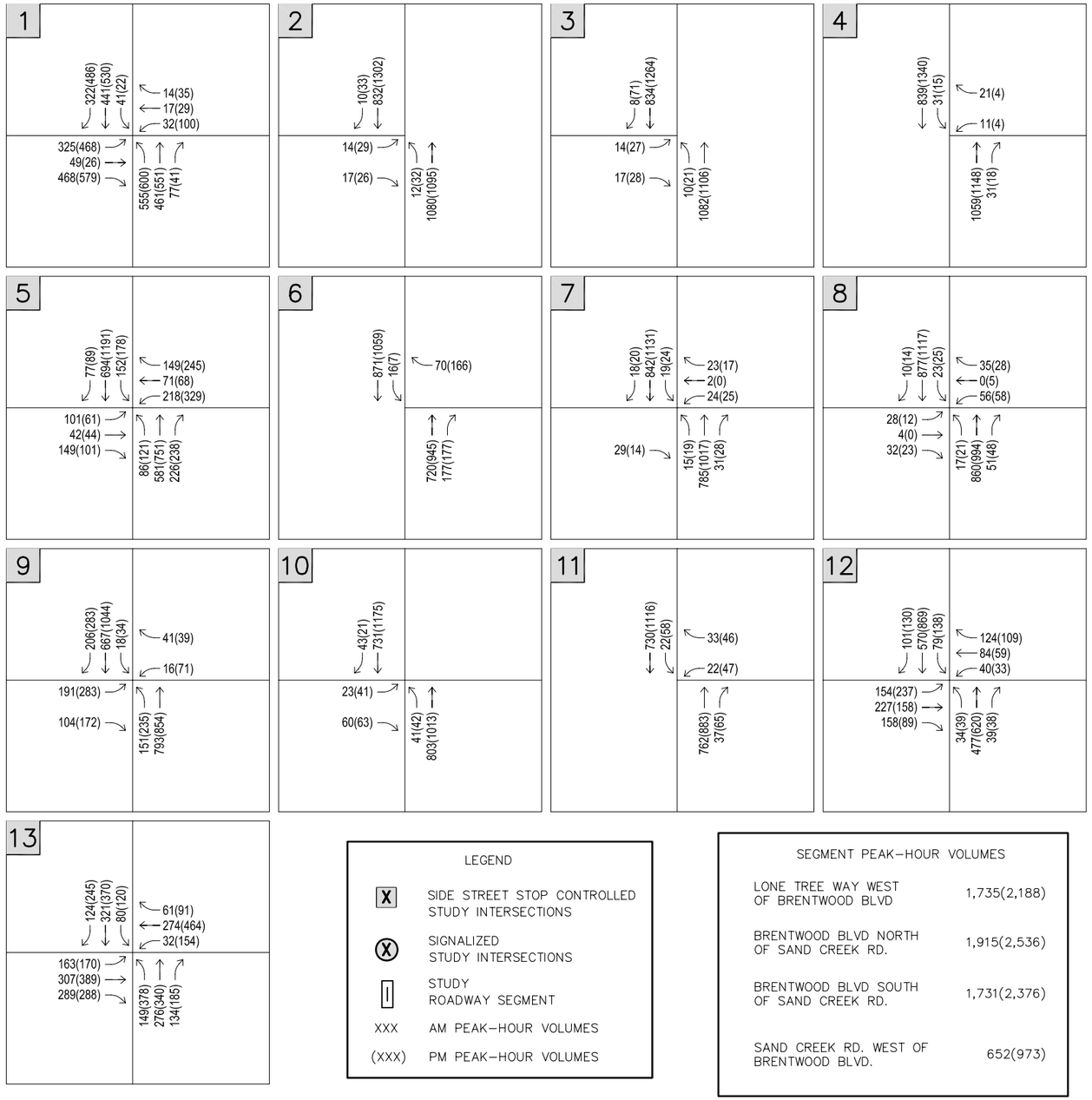
Table 11 – Cumulative (2030) Intersection Levels of Service

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec.) or V/C ratio*	LOS	Delay (sec.) or V/C ratio*	LOS	
1	Brentwood Blvd. @ Lone Tree Wy.	Signal	0.824	D	1.049	F	N/A
2	Brentwood Blvd. @ Sunrise Dr.	Side Street Stop	17.1	C	29.0	D	NO
3	Brentwood Blvd. @ Gregory Ln.	Side Street Stop	17.1	C	28.3	D	NO
4	Brentwood Blvd. @ Homecoming Wy.	Side Street Stop	40.9	E	83.1	F	NO
5	Brentwood Blvd. @ Grant St./Sunset Rd.	Signal	0.810	D	1.178	F	N/A
6	Brentwood Blvd. @ Sunset Ct.	Side Street Stop	16.5	C	33.9	D	**YES**
7	Brentwood Blvd. @ Havenwood Ave.	Side Street Stop	31.2	E	63.4	F	NO
8	Brentwood Blvd. @ Applewood Common	Signal	0.332	A	0.385	A	N/A
9	Brentwood Blvd. @ Sand Creek Rd.	Signal	0.497	A	0.74	C	N/A
10	Brentwood Blvd. @ Technology Wy.	Signal	0.297	A	0.433	A	N/A
11	Brentwood Blvd. @ Village Dr.	Side Street Stop	19.0	C	55.2	F	NO
12	Brentwood Blvd. @ Central Blvd./Sycamore Ave.	Signal	0.365	A	0.506	A	N/A
13	Sand Creek Rd. @ O'Hara Ave.	Signal	0.398	A	0.585	A	N/A

* Control delay for worst minor approach (worst minor movement) for TWSC.
1. Per the California Manual on Uniform Traffic Control Devices (CMUTCD), September 26, 2006, Section 4C.

Roadway Segments

Table 12 presents the roadway segment levels of service for the study roadway segments. As indicated in Table 12, the roadway segments operate from LOS A to LOS E.



LEGEND

X	SIDE STREET STOP CONTROLLED STUDY INTERSECTIONS
(X)	SIGNALIZED STUDY INTERSECTIONS
I	STUDY ROADWAY SEGMENT
XXX	AM PEAK-HOUR VOLUMES
(XXX)	PM PEAK-HOUR VOLUMES

SEGMENT PEAK-HOUR VOLUMES

LONE TREE WAY WEST OF BRENTWOOD BLVD	1,735(2,188)
BRENTWOOD BLVD NORTH OF SAND CREEK RD.	1,915(2,536)
BRENTWOOD BLVD SOUTH OF SAND CREEK RD.	1,731(2,376)
SAND CREEK RD. WEST OF BRENTWOOD BLVD.	652(973)

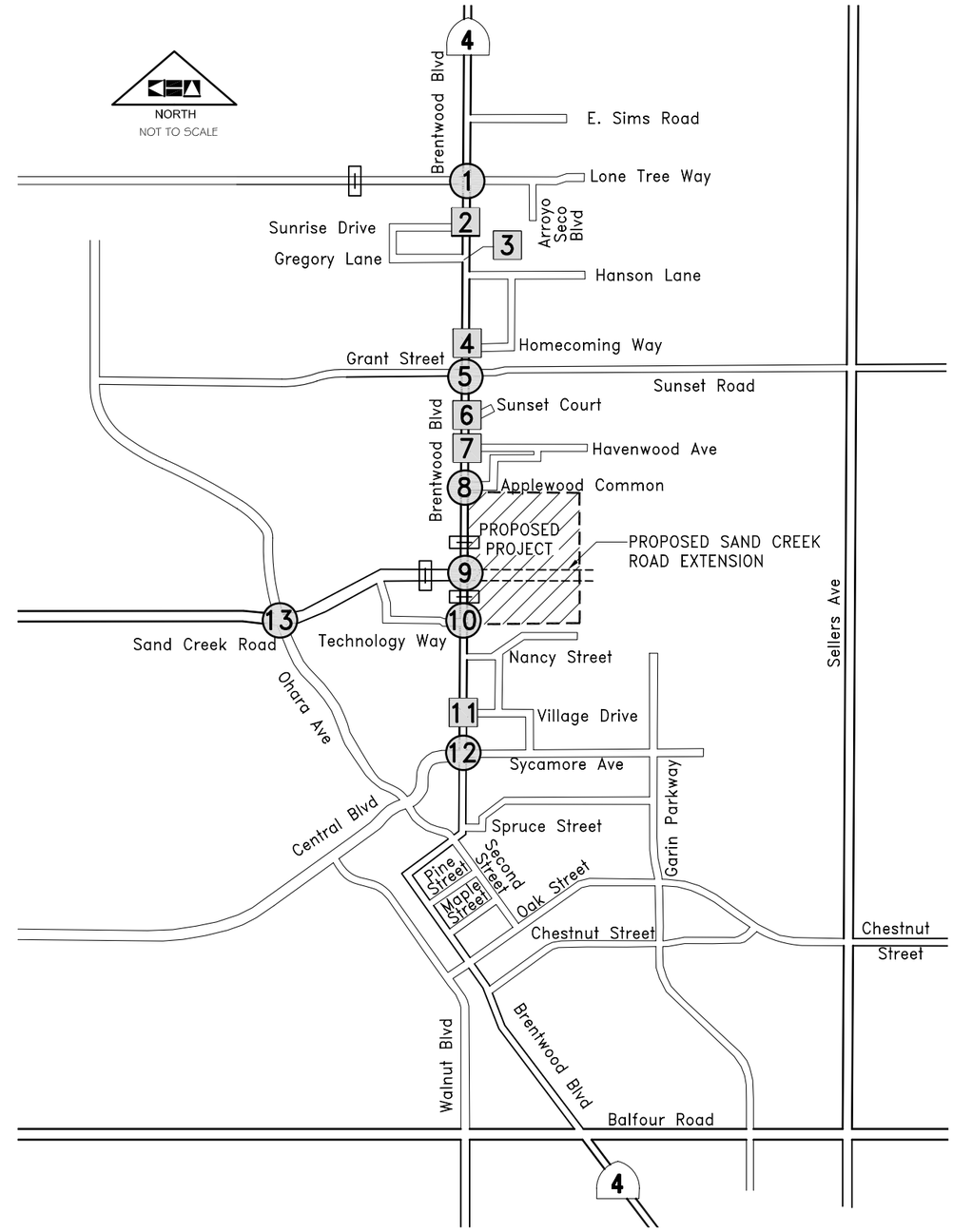


FIGURE 11

CUMULATIVE (2030) PEAK-HOUR TRAFFIC VOLUMES

SCIORTINO RANCH
BRENTWOOD, CA

Table 12 – Cumulative (2030) Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS	PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.**	Collector	2	86.2%	E	91.0%	E
2	Brentwood Blvd. north of Sand Creek Rd.*	Arterial	4	571 / 497	B / B	663 / 768	B / B
3	Brentwood Blvd. south of Sand Creek Rd.*	Arterial	4	510 / 425	B / A	628 / 742	B / B
4	Sand Creek Rd. west of Brentwood Blvd.**	Arterial	4	175 / 212	A / A	262 / 298	A / A

Source: *Highway Capacity Manual, 2000.*
[1] PTSF = Percent Time Spent Following, pc/hr/ln = passenger cars per hour per lane.
* Results for this roadway segment are presented in **NB / SB** format (where applicable).
** Results for this roadway segment are presented in **EB / WB** format (where applicable).

CUMULATIVE (2030) PLUS PROPOSED PROJECT CONDITIONS

The Cumulative (2030) volumes include build out of the project site with land uses specified in the BBSP. Therefore, for the Cumulative plus Proposed Project Conditions, trips associated for the site in the BBSP land uses were first removed from the network. The project trips were then added to the network to establish Cumulative plus Proposed Project Conditions. Traffic volumes for this scenario are presented in Figure 12. Analysis worksheets for this scenario are provided in Appendix F.

Intersections

Table 13 presents the peak-hour intersection operating conditions for the study intersections. As indicated in Table 13, the study intersections operate from LOS A to LOS F during the AM and PM peak-hours.

Roadway Segments

Table 14 presents the roadway segment levels of service for the study roadway segments. As indicated in Table 14, the roadway segments operate at LOS A to LOS E.

Table 13 – Cumulative (2030) plus Proposed Project Levels of Service

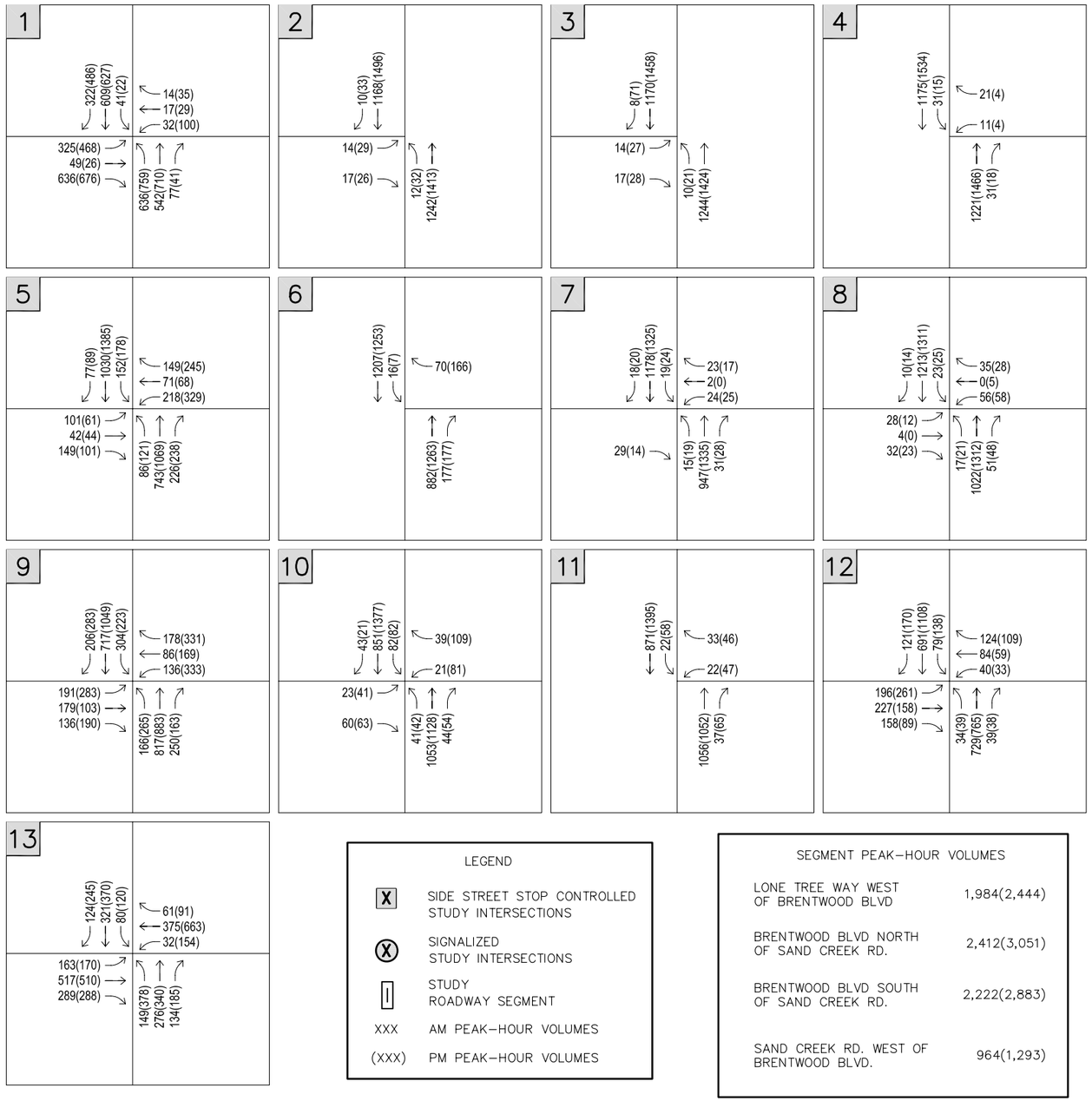
#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour		Meets Signal Warrant[1]
			Delay (sec.) or V/C ratio*	LOS	Delay (sec.) or V/C ratio*	LOS	
1	Brentwood Blvd. @ Lone Tree Wy.	Signal	0.924	E	1.175	F	N/A
2	Brentwood Blvd. @ Sunrise Dr.	Side Street Stop	23.1	C	40.8	E	NO
3	Brentwood Blvd. @ Gregory Ln.	Side Street Stop	23.0	C	39.5	E	NO
4	Brentwood Blvd. @ Homecoming Wy.	Side Street Stop	88.7	F	197.6	F	NO
5	Brentwood Blvd. @ Grant St./Sunset Rd.	Signal	1.014	F	1.295	F	N/A
6	Brentwood Blvd. @ Sunset Ct.	Side Street Stop	20.0	C	92.2	F	**YES**
7	Brentwood Blvd. @ Havenwood Ave.	Side Street Stop	60.1	F	192.1	F	NO
8	Brentwood Blvd. @ Applewood Common	Signal	0.419	A	0.453	A	N/A
9	Brentwood Blvd. @ Sand Creek Rd.	Signal	0.731	C	0.936	E	N/A
10	Brentwood Blvd. @ Technology Wy.	Signal	0.469	A	0.627	B	N/A
11	Brentwood Blvd. @ Village Dr.	Side Street Stop	30.4	D	139.9	F	NO
12	Brentwood Blvd. @ Central Blvd./Sycamore Ave.	Signal	0.436	A	0.605	B	N/A
13	Sand Creek Rd. @ O'Hara Ave.	Signal	0.428	A	0.645	B	N/A

Shaded Cells indicate significant impact
* Control delay for worst minor approach (worst minor movement) for TWSC.
1. Per the California Manual on Uniform Traffic Control Devices (CMUTCD), September 26, 2006, Section 4C.

Table 14 – Cumulative (2030) plus Proposed Project Roadway Segment Levels of Service

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS	PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS
1	Lone Tree west of Brentwood Blvd.**	Collector	2	89.1%	E	92.8%	E
2	Brentwood Blvd. north of Sand Creek Rd.*	Arterial	4	662 / 685	B / B	844 / 877	C / C
3	Brentwood Blvd. south of Sand Creek Rd.*	Arterial	4	667 / 535	B / B	756 / 906	B / C
4	Sand Creek Rd. west of Brentwood Blvd.**	Arterial	4	301 / 273	A / A	332 / 413	A / A

Source: *Highway Capacity Manual, 2000.*
[1] PTSF = Percent Time Spent Following, pc/hr/ln = passenger cars per hour per lane.
* Results for this roadway segment are presented in **NB / SB** format (where applicable).
** Results for this roadway segment are presented in **EB / WB** format (where applicable).



LEGEND

X	SIDE STREET STOP CONTROLLED STUDY INTERSECTIONS
(X)	SIGNALIZED STUDY INTERSECTIONS
I	STUDY ROADWAY SEGMENT
XXX	AM PEAK-HOUR VOLUMES
(XXX)	PM PEAK-HOUR VOLUMES

SEGMENT PEAK-HOUR VOLUMES

LONE TREE WAY WEST OF BRENTWOOD BLVD	1,984(2,444)
BRENTWOOD BLVD NORTH OF SAND CREEK RD.	2,412(3,051)
BRENTWOOD BLVD SOUTH OF SAND CREEK RD.	2,222(2,883)
SAND CREEK RD. WEST OF BRENTWOOD BLVD.	964(1,293)

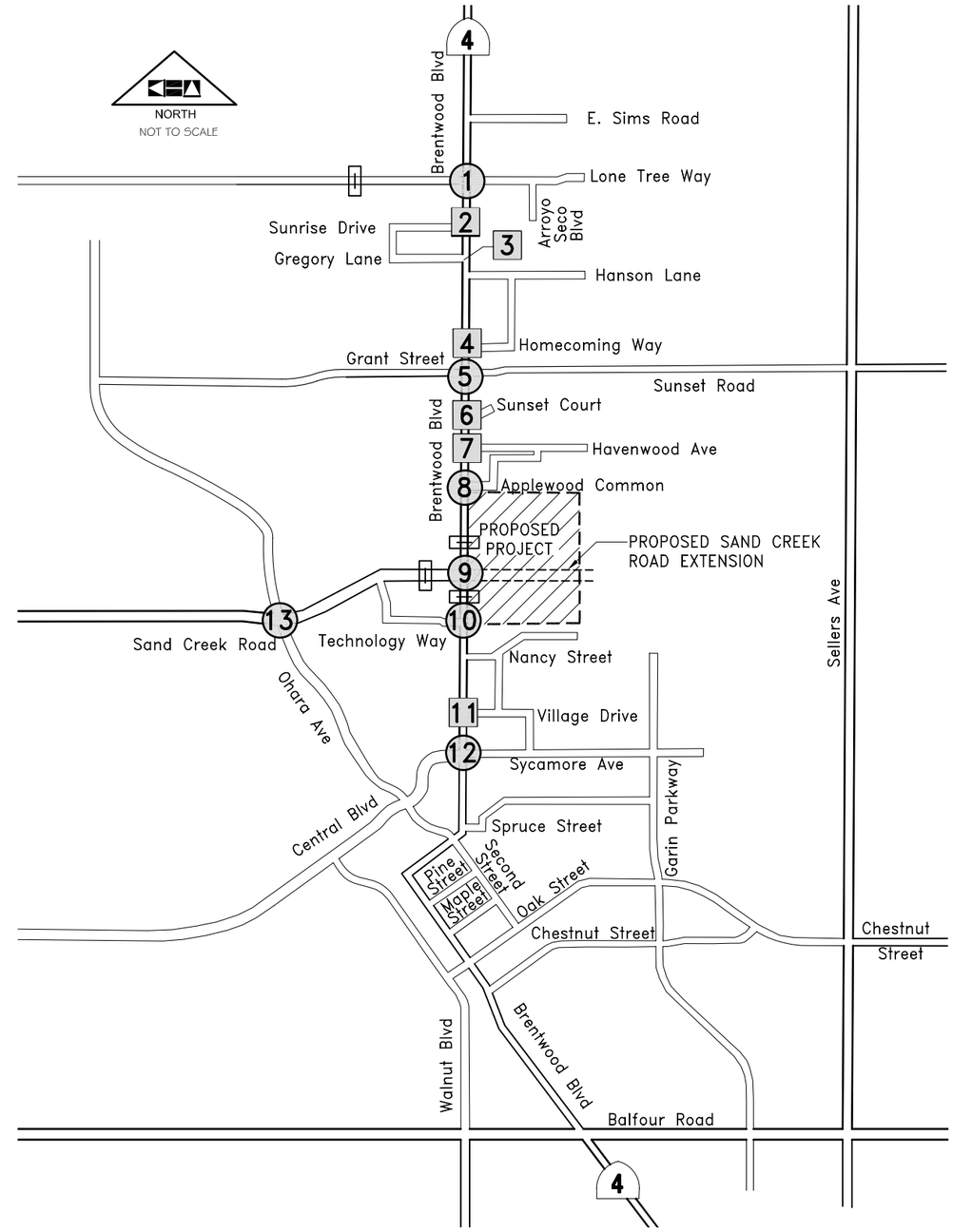


FIGURE 12

CUMULATIVE (2030) PLUS PROPOSED PROJECT PEAK-HOUR TRAFFIC VOLUMES

SCIORTINO RANCH
BRENTWOOD, CA

IMPACTS AND MITIGATION

Standards of Significance

Impacts to intersections and roadway segments are created when traffic associated with the proposed project causes the facility, which operates at acceptable LOS without the proposed project, to fall below a specific threshold. Per the City's General Plan[15], the City must "maintain a level of service standard of 'D' or better throughout the vehicular street system." Furthermore, according to the General Plan, a significant impact would occur if the addition of the proposed project results in any of the following:

- Causes LOS at a signalized intersection to deteriorate from an acceptable level (LOS D or better with a V/C ratio equal to or less than 0.85) to an unacceptable level (LOS D or worse with a V/C ratio greater than 0.85);
- Causes the V/C ratio at a signalized intersection operating at an unacceptable level (V/C ratio greater than 0.85) to increase by more than 0.01;
- Causes LOS at an unsignalized intersection to degrade to worse than mid-LOS D (average delay of 30 seconds per vehicle) or causes an unsignalized intersection to meet traffic signal warrants based on Warrant 3B (peak-hour volume warrant) as presented in the *California Manual of Uniform Traffic Control Devices (CMUTCD)*, dated September 26, 2006;
- Conflicts with existing, planned, or possible future transit, bicycle, and/or pedestrian facilities and services;
- Conflicts or creates demand for public transit services above that which is provided, or planned;
- The path of travel between the project area and transit stops would not meet current California Title 24 handicap accessibility standards; or
- Does not provide connections to bicycle and pedestrian circulation systems of the surrounding area.

Traffic Service Objectives (TSOs) have been developed by the East County Regional Transportation Committee known as TRANSPLAN. TRANSPLAN has included TSOs within the East County Action Plan and defines a significant impact threshold of LOS E for unsignalized intersections along SR-4 (non-freeway segments) between SR-160 and Balfour Road[16]. However, since the City of Brentwood's standard of significance, LOS D, is more conservative, it was applied for this project.

Existing plus Approved Projects plus Proposed Project Conditions

Intersections

Brentwood Boulevard at Homecoming Way

Impact

As shown in Table 9, the addition of the project trips causes the LOS to change from LOS C to LOS E in the AM peak-hour and from LOS D to LOS E in the PM peak-hour. ***This is a significant impact.***

Mitigation

The significant impact at this intersection during the AM and PM peak-hour is mitigated with elimination of left turns from the westbound approach. As shown in Table 15, restriction of westbound left-turns results in the intersection operating at LOS B during the AM peak-hour and LOS C during PM peak-hour. It should be noted that the westbound left turns were routed to Sunset Road via McHenry Way. The increased westbound left-turning volume had nominal impact at the intersection of Sunset Road and Brentwood Boulevard.

[15] *City of Brentwood General Plan, 2001-2021,* Circulation Element, January 2006.
[16] Per letter from John Sighamony, TRANSPLAN, September 25, 2007.

Therefore, the impact is ***less than significant***.

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Brentwood Boulevard at Grant Street / Sunset Road

Impact
As shown in Table 9, the addition of the project trips causes this signalized intersection to degrade from LOS B to LOS D during the AM peak-hour and from LOS D to LOS E in the PM peak-hour. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the AM and PM peak-hours can be mitigated with lane modifications to add a through lane to the north and southbound approaches. The lane modification would include converting the northbound right-turn lane into a through-right lane, as well as, the addition of a southbound through lane. These improvements are included in a city project to widen Brentwood Boulevard to four lanes and the proposed project should a fair-share of the identified improvements. As shown in Table 15, with lane modifications the intersection operates at LOS B during the AM peak hour and LOS C during the PM peak-hour. Therefore, the impact is ***less than significant.***

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Brentwood Boulevard at Havenwood Avenue

Impact
As shown in Table 9, the addition of the project trips causes the LOS to change from LOS D to LOS F in the AM peak-hour. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the AM peak-hour is mitigated with elimination of through and left-turn movements from the westbound approach. As shown in Table 15, restriction of westbound through and left-turn movements results in the intersection operating at LOS C during the AM peak-hour. Therefore, the impact is *less than significant***.**

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Brentwood Boulevard at Village Drive

Impact
As shown in Table 9, the addition of the project trips causes the LOS to change from LOS D to LOS E in the PM peak-hour. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the PM peak-hour is mitigated with elimination of left turns from the westbound approach. As shown in Table 15, restriction of westbound left-turns results in the intersection operating at LOS B during the PM peak-hour. It should be noted that the westbound left turns were routed to Sycamore Avenue via Barbara Street. The increased westbound left-turning volume had nominal impact at the intersection of Sycamore Avenue and Brentwood Boulevard. Therefore, the impact is ***less than significant.***

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Roadway Segments

Impacts
There were no impacts to roadway segments.

Mitigation

None Required.

Bicycle and Pedestrian Facilities
The City's General Plan states, "as roadways are widened and improved, the City is requiring designs incorporating six to eight-foot wide bike lanes…Sidewalks are part of the City's standard plans for arterial, collector, and local streets". Build-out of the proposed project is not expected to conflict with existing or planned bicycle and/or pedestrian facilities. As a result, impacts would be expected to be ***less than significant.***

Table 15 – Existing plus Approved Projects plus Proposed Project Mitigated Intersection LOS

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour	
			Delay (sec.) or V/C ratio*	LOS	Delay (sec.) or V/C ratio*	LOS
1	Brentwood Blvd. @ Lone Tree Wy.	Signal				
2	Brentwood Blvd. @ Sunrise Dr.	Side Street Stop				
3	Brentwood Blvd. @ Gregory Ln.	Side Street Stop				
4	Brentwood Blvd. @ Homecoming Wy.	Side Street Stop	14.5	B	21.2	C
5	Brentwood Blvd. @ Grant St./Sunset Rd.	Signal	0.607	B	0.774	C
6	Brentwood Blvd. @ Sunset Ct.	Side Street Stop				
7	Brentwood Blvd. @ Havenwood Ave.	Side Street Stop	16.3	C		
8	Brentwood Blvd. @ Applewood Common	Signal				
9	Brentwood Blvd. @ Sand Creek Rd.	Signal				
10	Brentwood Blvd. @ Technology Wy.	Signal				
11	Brentwood Blvd. @ Village Dr.	Side Street Stop			12.9	B
12	Brentwood Blvd. @ Central Blvd./Sycamore Ave.	Signal				
13	Sand Creek Rd. @ O'Hara Ave.	Signal				

Shaded Cells indicate no mitigation is required
* Control delay for worst minor approach (worst minor movement) for TWSC.
1. Per the California Manual on Uniform Traffic Control Devices (CMUTCD), September 26, 2006, Section 4C.

Transit Facilities

Tri Delta Transit has published a short range transit plan that provides information regarding ridership trends for it bus routes[17]. The short range plan indicates Route 391, which runs along Brentwood Boulevard has an average of 15.8 passengers per revenue hour and runs on 30 minute headways during the peak hour. Similarly, Route 300, which is an express route, has an average ridership of 9.8 passengers per revenue hour and operates on 20 minute headways. It is assumed buses operated on these routes have a seating capacity of 39 passengers. As such, the proposed project is not expected to exceed the capacity of the transit service and the impact is expected to be ***less than significant.***

Cumulative plus Proposed Project Conditions

Intersections

Brentwood Boulevard at Lone Tree Way

Impact

As shown in Table 13, the addition of the project trips causes this signalized intersection to degrade from LOS D to LOS E during the AM peak-hour. Additionally, the intersection operates below LOS D without the

[17] *Tri Delta Transit Short Range Transit Plan FY 2005-2015, Final*, Eastern Contra Costa Transit Authority, January 2006.

project during the PM peak- hour and the addition of project trips causes the volume to capacity ratio to increase by more than .01. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the AM and PM peak-hour is mitigated with the addition of a dedicated right turn lane and conversion of the southbound through-right lane to a southbound through lane. As shown in

Table 16, the lane modifications results in the intersection operating with a v/c ratio below the without project scenario. Therefore, ***this impact is less than significant***.

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Brentwood Boulevard at Sunrise Drive

Impact
As shown in Table 13, the addition of the project trips causes the LOS to change from LOS D to LOS E in the PM peak-hour. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the PM peak-hour is mitigated with elimination of all left and right-turning movements at this intersection. It should be noted that all traffic destined for Sunrise Drive will be diverted to the intersection of Brentwood Boulevard and Gregory Lane. The increased traffic volume at Gregory Lane will cause it to meet the peak hour signal warrant. The mitigation measure at Brentwood and Sunrise Drive will also include the signalization of Brentwood Boulevard and Gregory Lane. As shown in Table 16, this mitigation measure results in the intersection operating at LOS A during the PM peak-hour. Therefore, this impact is ***less than significant.***

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Brentwood Boulevard at Gregory Lane

Impact
As shown in Table 13, the addition of the project trips causes the LOS to change from LOS D to LOS E in the PM peak-hour. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the PM peak-hour is mitigated with signalization. It should

be noted that all traffic destined for Sunrise Drive will be diverted to the intersection of Brentwood Boulevard and Gregory Lane. The increased traffic volume at Gregory Lane will cause it to meet the peak hour signal warrant. This signal should be designed to include the intersection of Brentwood Boulevard and Beverly Place. This signal arrangement will eliminate the left-turn vehicle conflicts between eastbound left turning vehicles at Gregory Lane and westbound left-turn vehicles at Beverly Place. As shown in Table 16, this mitigation measure results in the intersection operating at LOS B during the PM peak-hour. Therefore, this impact is ***less than significant.***

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Brentwood Boulevard at Grant Street / Sunset Road

Impact
As shown in Table 13, the addition of the project trips causes this signalized intersection to degrade from LOS D to LOS F during the AM peak-hour. Additionally, the intersection operates below LOS D without the project during the PM peak- hour and the addition of project trips causes the volume to capacity ratio to increase by more than .01. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the AM and PM peak-hours can be mitigated with lane modifications to add a through lane to the northbound and southbound approaches. The lane modification would include converting the northbound right-turn lane into a through-right lane, as well as, the addition of a southbound through lane. As shown in Table 16, with lane modifications the intersection operates at LOS B during the AM peak-hour and LOS D during the PM peak-hour. Therefore, the impact is ***less than significant.***

Figure 13 illustrates these recommended lane modifications. The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Brentwood Boulevard at Sand Creek Road

Impact
As shown in Table 13, the addition of the project trips causes this signalized intersection to degrade from LOS C to LOS E during the PM peak-hour. ***This is a significant impact.***

Mitigation
The significant impact at this intersection during the PM peak-hours can be mitigated with lane modifications. The lane modification would include the addition of a southbound right turn lane and converting the southbound through-right turn lane to a through lane. As shown in Table 16, with lane modifications the intersection operates at LOS D during the PM peak-hour. Therefore, the impact is ***less than significant.***

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Roadway Segments

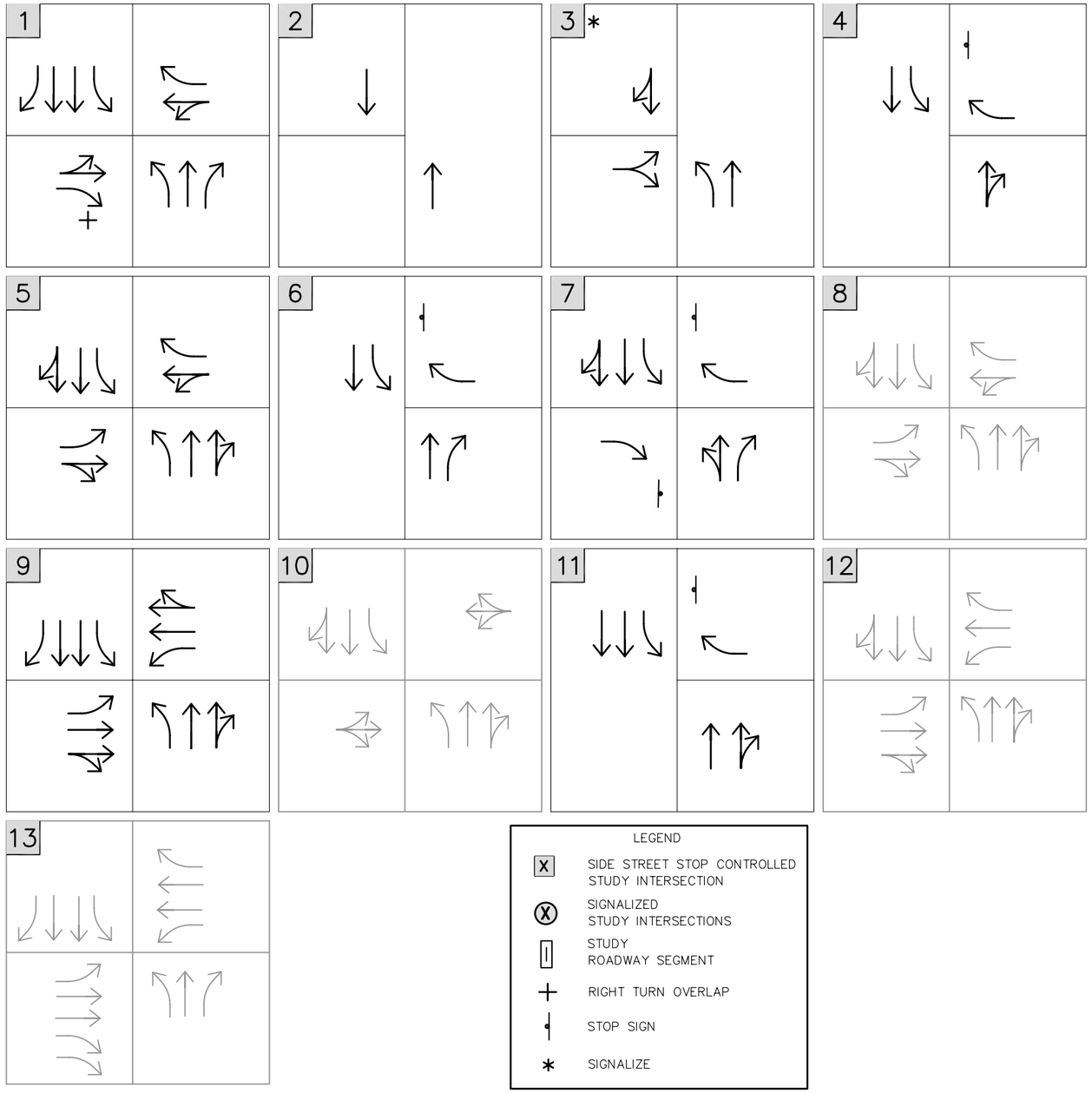
Impact
As shown in Table 14, the addition of the project causes this study roadway segment, which operates at LOS C during both AM and PM peak-hours without the proposed project, to degrade to LOS E for both peak-hours. ***This is a significant impact.***

Mitigation
The significant impact along this roadway segment during the AM and PM peak-hours can be mitigated with conversion to a four lane roadway. As shown in Table 17, this improvement is expected to allow this study roadway segment to operate at LOS B under both peak-hours and the impact will be ***less than significant***.

The mitigated analysis worksheets are provided in Appendix G.

The project applicant shall be responsible a fair-share of these improvements and the City has previously determined that project applicants within the Brentwood Boulevard Specific Plan boundaries shall be required to pay the applicable Transportation Development Fee prior to the issuance of building permits or building occupancy. Additionally project specific impacts will be determined and required project improvements will be constructed and/or funded by the various developments to adequately mitigate project impacts.

Bicycle and Pedestrian Facilities
The City's General Plan states, "as roadways are widened and improved, the City is requiring designs incorporating six to eight-foot wide bike lanes…Sidewalks are part of the City's standard plans for arterial, collector, and local streets". Build-out of the proposed project is not expected to conflict with existing or planned bicycle and/or pedestrian facilities. As a result, impacts would be expected to be ***less than significant.***



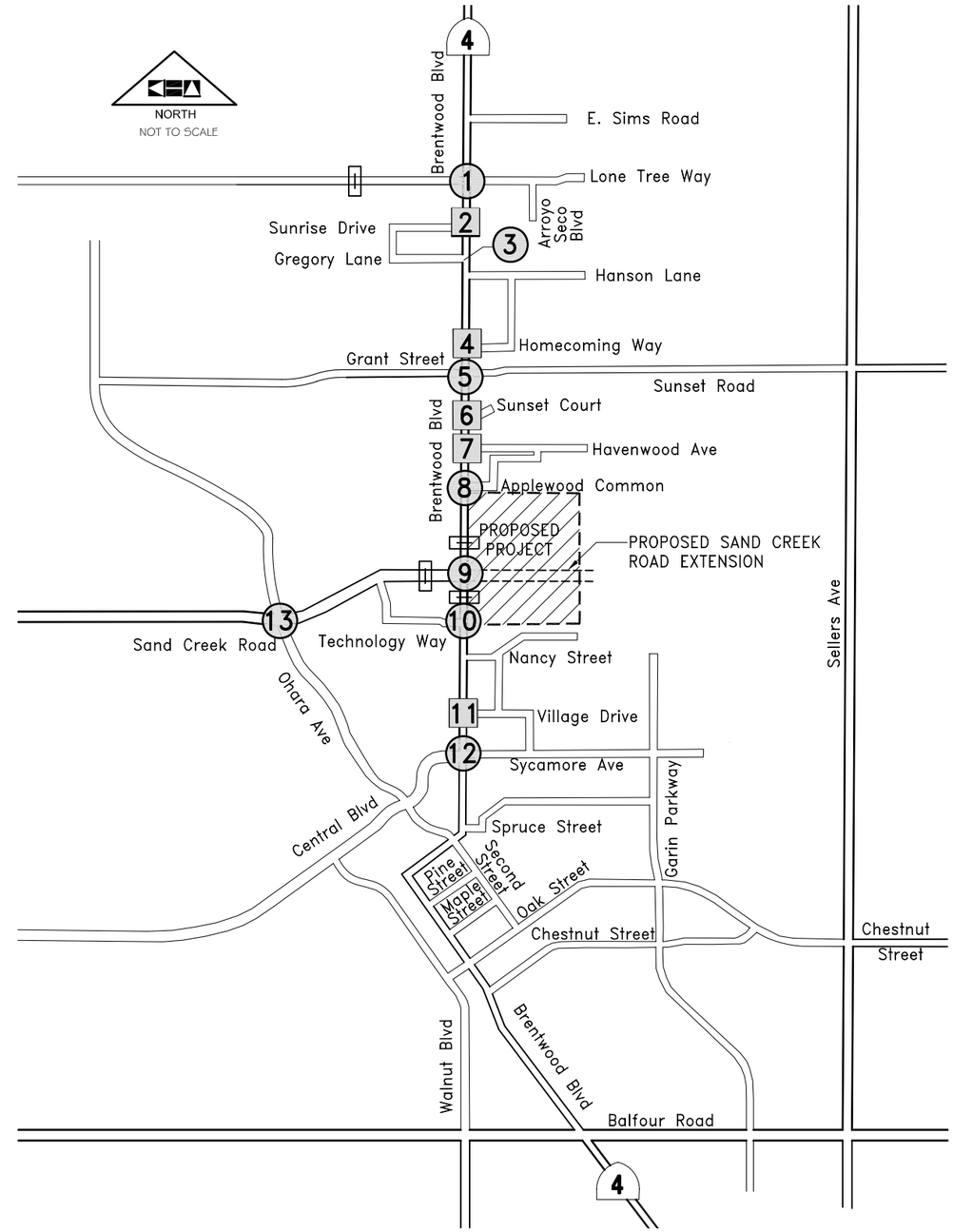


FIGURE 13

LANE GEOMETRIES WITH MITIGATION

SCIORTINO RANCH
BRENTWOOD, CA

Table 16 – Cumulative (2030) plus Proposed Project Mitigated Intersection LOS

#	Intersection	Traffic Control	AM Peak-Hour		PM Peak-Hour	
			Delay (sec.) or V/C ratio*	LOS	Delay (sec.) or V/C ratio*	LOS
1	Brentwood Blvd. @ Lone Tree Wy.	Signal	0.826	D	1.028	F
2	Brentwood Blvd. @ Sunrise Dr.	Side Street Stop			0.0	A
3	Brentwood Blvd. @ Gregory Ln.	Signal			13.6	B
4	Brentwood Blvd. @ Homecoming Wy.	Side Street Stop				
5	Brentwood Blvd. @ Grant St./Sunset Rd.	Signal	0.678	B	0.848	D
6	Brentwood Blvd. @ Sunset Ct.	Signal				
7	Brentwood Blvd. @ Havenwood Ave.	Side Street Stop				
8	Brentwood Blvd. @ Applewood Common	Signal				
9	Brentwood Blvd. @ Sand Creek Rd.	Signal			0.851	D
10	Brentwood Blvd. @ Technology Wy.	Signal				
11	Brentwood Blvd. @ Village Dr.	Side Street Stop				
12	Brentwood Blvd. @ Central Blvd./Sycamore Ave.	Signal				
13	Sand Creek Rd. @ O'Hara Ave.	Signal				

Shaded Cells indicate no mitigation is required
* Control delay for worst minor approach (worst minor movement) for TWSC.
1. Per the California Manual on Uniform Traffic Control Devices (CMUTCD), September 26, 2006, Section 4C.

Table 17 – Cumulative (2030) plus Proposed Project Mitigated Roadway Segment LOS

#	Intersection	Facility Type	# of Lanes	AM Peak-Hour		PM Peak-Hour	
				PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS	PTSF (2 lane) pc/hr/ln (4 lane)[1]	LOS
1	Lone Tree Wy. west of Brentwood Blvd.**	Collector	4	541 / 560	B / B	706 / 649	B / B

Source: *Highway Capacity Manual, 2000.*
** Results for this roadway segment are presented in **EB / WB** format (where applicable).
[1] PTSF = Percent Time Spent Following, pc/hr/ln = passenger cars per hour per lane.

Transit Facilities

Tri Delta Transit has published a short range transit plan that notes "significant service expansion is warranted to address commute travel congestion on Highway 4 [and]…rapid development areas in…Brentwood…" The short range plan identifies the need to "refine and expand local routes in Brentwood…" prior to 2010. However, the plan also notes "estimated revenues are not sufficient to support system expansion."

As noted for the Existing plus Approved Project plus the Proposed Project Scenario, transit ridership is currently significantly below capacity. In addition, it is anticipated the adjustments to service will be based on ridership trends, including those in the project area. As a result, the impact of the project on transit services is expected to be ***less than significant.***

ALTERNATIVES ANALYSIS

Two alternatives, referred to as Alternative B and Alternative C, have been proposed for the proposed project. The land uses for these alternatives are indicated in Table 18.

Table 18 – Land Use Summary for Project Alternatives

Land Use	Scenario B	Scenario C
Apartment Units	468	783
Single-Family Detached Housing	140	140
Shopping Center (s.f.)	276.6	162.3
General Office Building (s.f.)	0	0
College (s.f.)	0	0

Vehicle trips for the two alternatives were estimated using the same procedure used for the proposed project. Trip generation for Alternative B is provided in Table 19 and trip generation for Alternative C is provided in Table 20. Table 21 presents a comparison of vehicle trip generation for Alternatives B and C with vehicle trips estimated for the proposed project. As indicated in Table 21, both Alternatives B and C are expected to generate considerably fewer trips than the proposed project. As a result, both alternatives would likely result in fewer impacts than the proposed project. If the either Alternative B or C is to be implemented, an intersection level analysis of the alternative selected should be conducted to identify specific impacts and mitigation measures which differ from the proposed project.

Table 19 – Trip Generation for Alternative B

ITE Land Use	Size[2]		Total Daily Trips	AM Peak Hour					PM Peak Hour				
				Total Trips	IN		OUT		Total Trips	IN		OUT	
					%	Trips	%	Trips		%	Trips	%	Trips
Apartment	468.0		2,963	233	20%	47	80%	186	275	65%	179	35%	96
Single-Family Detached Housing	140.0		1,417	107	25%	27	75%	81	145	63%	91	37%	54
Shopping Center	276.6		13,157	288	61%	176	39%	112	1,225	48%	588	52%	637
General Office Building	0.0		0	0	88%	0	12%	0	0	17%	0	83%	0
College	0.0		0	0	88%	0	12%	0	0	17%	0	83%	0
Subtotal New Trips:			***17,537***	***629***		***249***		***379***	***1,645***		***858***		***787***
Internal Reduction[1] (Daily, PM)	15.0%	15.7%	-2,629						-258		-135		-123
Pass-By Reduction[1] (LU 820)	34%		-4,473						-417		-200		-217
Alternate Mode Reduction[3]	7%		-1,228	-44		-17		-27	-115		-60		-55
Net New External Trips:			***9,207***	***585***		***232***		***353***	***856***		***464***		***392***

Source: *Trip Generation, 7th Edition* , ITE.
[1] Based on methodology published in *Trip Generation Handbook, Second Edition* , ITE.
[2] Dwelling units for residential uses and square feet for non-residential uses.
[3] Per the Brentwood Boulevard Specific Plan ADEIR.

Table 20 – Trip Generation for Alternative C

ITE Land Use	Size[2]	Total Daily Trips	AM Peak Hour					PM Peak Hour				
			Total Trips	IN		OUT		Total Trips	IN		OUT	
				%	Trips	%	Trips		%	Trips	%	Trips
Apartment	783.0	4,856	387	20%	77	80%	310	448	65%	291	35%	157
Single-Family Detached Housing	140.0	1,417	107	25%	27	75%	81	145	63%	91	37%	54
Shopping Center	162.3	9,302	209	61%	128	39%	82	862	48%	414	52%	448
General Office Building	0.0	0	0	88%	0	12%	0	0	17%	0	83%	0
College	0.0	0	0		0		0	0		0		0
Subtotal New Trips:		***15,575***	***704***		***232***		***472***	***1,455***		***796***		***659***
Internal Reduction[1] (Daily, PM)	11.9% 12.5%	-1,860						-182		-100		-82
Pass-By Reduction[1] (LU 820)	34%	-3,163						-293		-141		-152
Alternate Mode Reduction[3]	7%	-1,090	-49		-16		-33	-102		-56		-46
Net New External Trips:		***9,462***	***655***		***216***		***439***	***878***		***500***		***378***

Source: *Trip Generation, 7th Edition*, ITE.
[1] Based on methodology published in *Trip Generation Handbook, Second Edition*, ITE.
[2] Dwelling units for residential uses and square feet for non-residential uses.
[3] Per the Brentwood Boulevard Specific Plan ADEIR.

Table 21 – Trip Comparison for the Project Alternatives

Scenario	Daily Trips	AM Trips	PM Trips
Proposed Project	13,129	1,244	1,280
Alternative B	9,207	585	856
Change from Proposed Project	*-3,922*	*-659*	*-424*
Alternative C	9,462	655	878
Change from Proposed Project	*-3,667*	*-589*	*-401*

CONCLUSIONS

Based upon the analysis documented in this report, the following conclusions are offered:

- The project will generate 13,129 new daily, 1,244 new AM peak-hour, and 1,280 new PM peak-hour vehicle trips.
- The proposed project is expected to result in significant impacts at a number of intersections under Existing plus Approved Projects plus Proposed Project and Cumulative plus Proposed Project scenarios. These impacts can be mitigated to be less than significant.
- The proposed project is expected to result in a significant impact to one roadway segment under cumulative plus proposed project conditions. This impact can be mitigated to be less than significant.
- The proposed project is not expected to result in impacts to bicycle, pedestrian, or transit facilities.
- The project alternatives will generate significantly fewer trips and result in lesser impacts than the proposed project.

Appendix A:

Traffic Count Data Sheets

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-001 BRENTWOOD-LONETREE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				LONE TREE WAY Westbound				BRENTWOOD BLVD. Northbound				LONE TREE WAY Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	60	18	78	3	4	1	8	46	54	1	101	7	1	22	30	217
07:15	2	70	18	90	2	1	0	3	41	56	1	98	8	0	33	41	232
07:30	0	68	13	81	7	2	2	11	57	67	1	125	7	0	30	37	254
07:45	1	101	32	134	15	3	2	20	50	65	1	116	26	3	43	72	342
Total	3	299	81	383	27	10	5	42	194	242	4	440	48	4	128	180	1045
08:00	2	90	31	123	10	2	1	13	47	80	7	134	23	2	52	77	347
08:15	0	96	28	124	4	0	0	4	41	82	4	127	28	0	49	77	332
08:30	1	87	18	106	3	1	1	5	42	79	3	124	20	1	45	66	301
08:45	0	90	17	107	0	3	1	4	48	61	0	109	20	0	37	57	277
Total	3	363	94	460	17	6	3	26	178	302	14	494	91	3	183	277	1257
*** BREAK ***																	
16:00	5	95	31	131	2	2	1	5	36	109	6	151	34	4	82	120	407
16:15	1	96	22	119	5	2	2	9	51	106	4	161	29	4	44	77	366
16:30	1	78	26	105	5	2	1	8	45	105	9	159	36	0	56	92	364
16:45	3	95	24	122	5	2	3	10	54	84	4	142	27	3	59	89	363
Total	10	364	103	477	17	8	7	32	186	404	23	613	126	11	241	378	1500
17:00	0	108	33	141	2	2	1	5	50	124	3	177	29	9	69	107	430
17:15	5	106	23	134	6	2	2	10	45	98	5	148	37	5	58	100	392
17:30	2	122	23	147	4	2	4	10	55	107	3	165	23	4	66	93	415
17:45	2	115	23	140	7	4	2	13	60	123	5	188	22	4	60	86	427
Total	9	451	102	562	19	10	9	38	210	452	16	678	111	22	253	386	1664
Grand Total	25	1477	380	1882	80	34	24	138	768	1400	57	2225	376	40	805	1221	5466
Apprch %	1.3	78.5	20.2		58	24.6	17.4		34.5	62.9	2.6		30.8	3.3	65.9		
Total %	0.5	27	7	34.4	1.5	0.6	0.4	2.5	14.1	25.6	1	40.7	6.9	0.7	14.7	22.3	

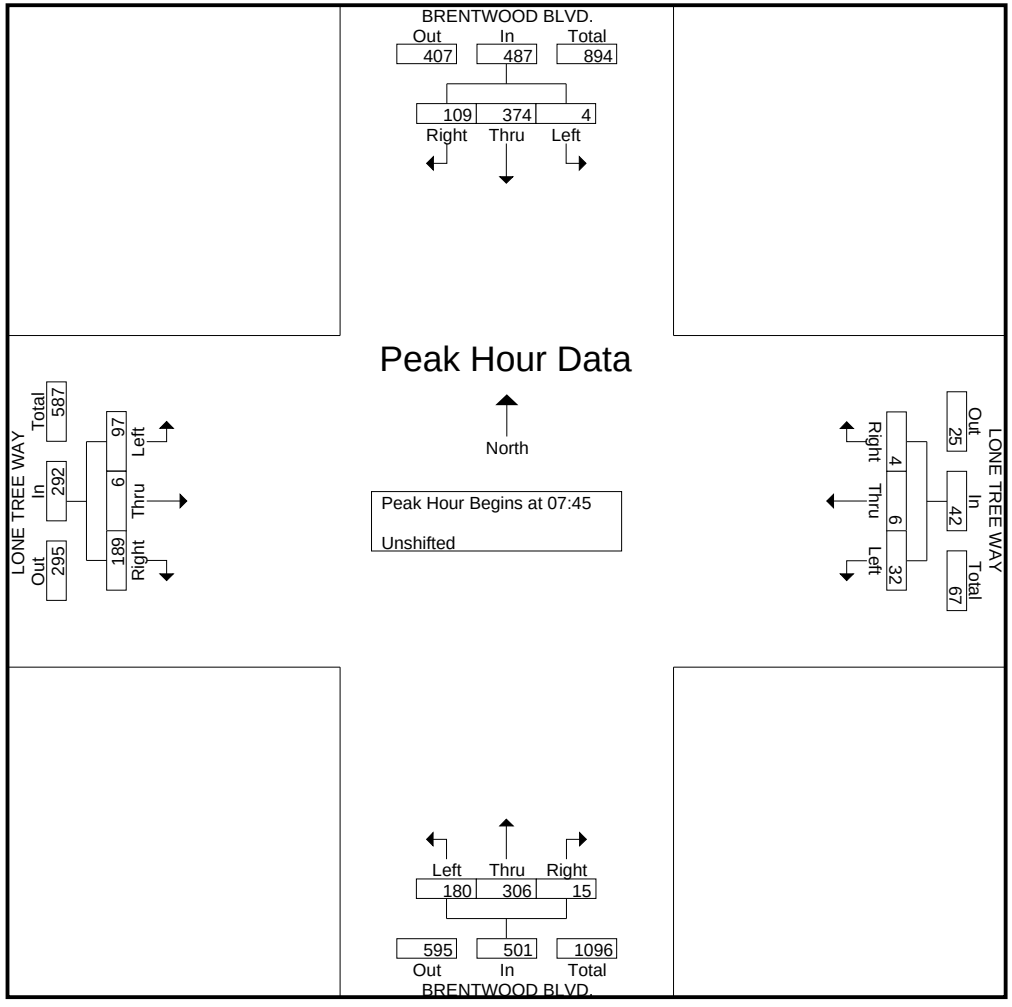
	BRENTWOOD BLVD. Southbound				LONE TREE WAY Westbound				BRENTWOOD BLVD. Northbound				LONE TREE WAY Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	1	**101**	**32**	**134**	**15**	**3**	**2**	**20**	**50**	65	1	116	26	**3**	43	72	342
08:00	**2**	90	31	123	10	2	1	13	47	80	**7**	**134**	23	2	**52**	**77**	**347**
08:15	0	96	28	124	4	0	0	4	41	**82**	4	127	**28**	0	49	77	332
08:30	1	87	18	106	3	1	1	5	42	79	3	124	20	1	45	66	301
Total Volume	4	374	109	487	32	6	4	42	180	306	15	501	97	6	189	292	1322
% App. Total	0.8	76.8	22.4		76.2	14.3	9.5		35.9	61.1	3		33.2	2.1	64.7		
PHF	.500	.926	.852	.909	.533	.500	.500	.525	.900	.933	.536	.935	.866	.500	.909	.948	.952

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-001 BRENTWOOD-LONETREE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	108	**33**	141	2	2	1	5	50	**124**	3	177	29	**9**	**69**	**107**	**430**
17:15	**5**	106	23	134	6	2	2	10	45	98	**5**	148	**37**	5	58	100	392
17:30	2	**122**	23	**147**	4	2	**4**	10	55	107	3	165	23	4	66	93	415
17:45	2	115	23	140	**7**	**4**	2	**13**	**60**	123	5	**188**	22	4	60	86	427
Total Volume	9	451	102	562	19	10	9	38	210	452	16	678	111	22	253	386	1664
% App. Total	1.6	80.2	18.1		50	26.3	23.7		31	66.7	2.4		28.8	5.7	65.5		
PHF	.450	.924	.773	.956	.679	.625	.563	.731	.875	.911	.800	.902	.750	.611	.917	.902	.967

All Traffic Data

(916) 771-8700
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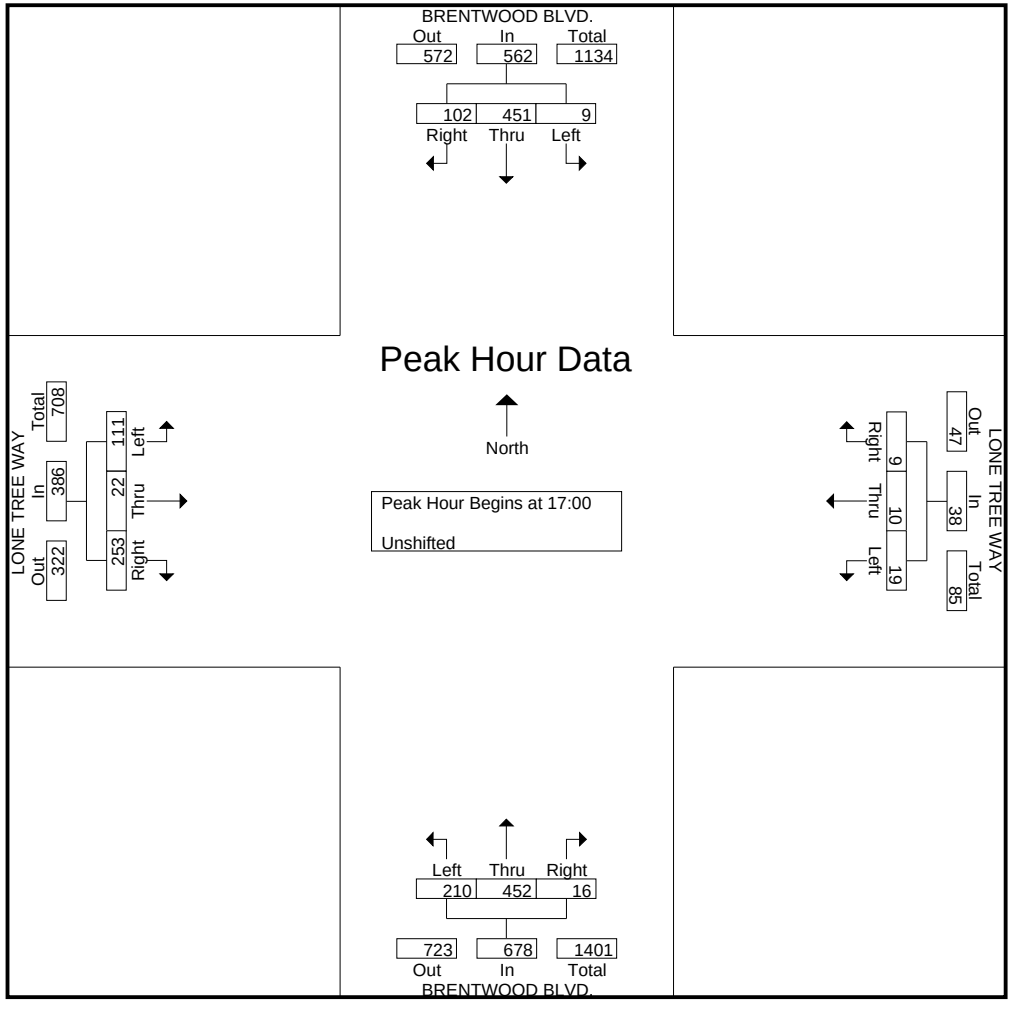
BRENTWOOD

File Name : 08-7637-001 BRENTWOOD-LONETREE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-002 BRENTWOOD-SUNRISE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				Westbound				BRENTWOOD BLVD. Northbound				SUNRISE DR. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	4	81	0	85	1	0	1	2	0	100	2	102	2	0	1	3	192
07:15	1	101	1	103	2	0	0	2	1	90	1	92	2	0	0	2	199
07:30	1	111	0	112	1	0	0	1	1	120	2	123	4	0	8	12	248
07:45	2	156	0	158	0	0	0	0	1	117	3	121	0	0	3	3	282
Total	8	449	1	458	4	0	1	5	3	427	8	438	8	0	12	20	921
08:00	3	149	1	153	1	0	0	1	5	133	2	140	0	0	1	1	295
08:15	2	146	3	151	4	0	0	4	4	122	4	130	2	0	3	5	290
08:30	2	139	2	143	2	0	1	3	2	130	1	133	1	0	1	2	281
08:45	1	119	3	123	2	0	0	2	3	110	4	117	2	0	2	4	246
Total	8	553	9	570	9	0	1	10	14	495	11	520	5	0	7	12	1112
*** BREAK ***																	
16:00	0	177	9	186	1	0	2	3	4	153	2	159	1	0	4	5	353
16:15	0	147	1	148	1	0	1	2	2	151	1	154	5	0	1	6	310
16:30	4	139	3	146	2	0	2	4	0	152	4	156	1	0	1	2	308
16:45	2	152	3	157	5	0	0	5	8	137	1	146	4	0	3	7	315
Total	6	615	16	637	9	0	5	14	14	593	8	615	11	0	9	20	1286
17:00	1	174	1	176	2	0	2	4	1	172	3	176	2	0	1	3	359
17:15	2	161	5	168	1	0	0	1	6	133	3	142	5	0	3	8	319
17:30	1	188	6	195	0	0	0	0	4	163	3	170	9	0	4	13	378
17:45	0	181	3	184	1	0	1	2	4	183	0	187	4	0	4	8	381
Total	4	704	15	723	4	0	3	7	15	651	9	675	20	0	12	32	1437
Grand Total	26	2321	41	2388	26	0	10	36	46	2166	36	2248	44	0	40	84	4756
Apprch %	1.1	97.2	1.7		72.2	0	27.8		2	96.4	1.6		52.4	0	47.6		
Total %	0.5	48.8	0.9	50.2	0.5	0	0.2	0.8	1	45.5	0.8	47.3	0.9	0	0.8	1.8	

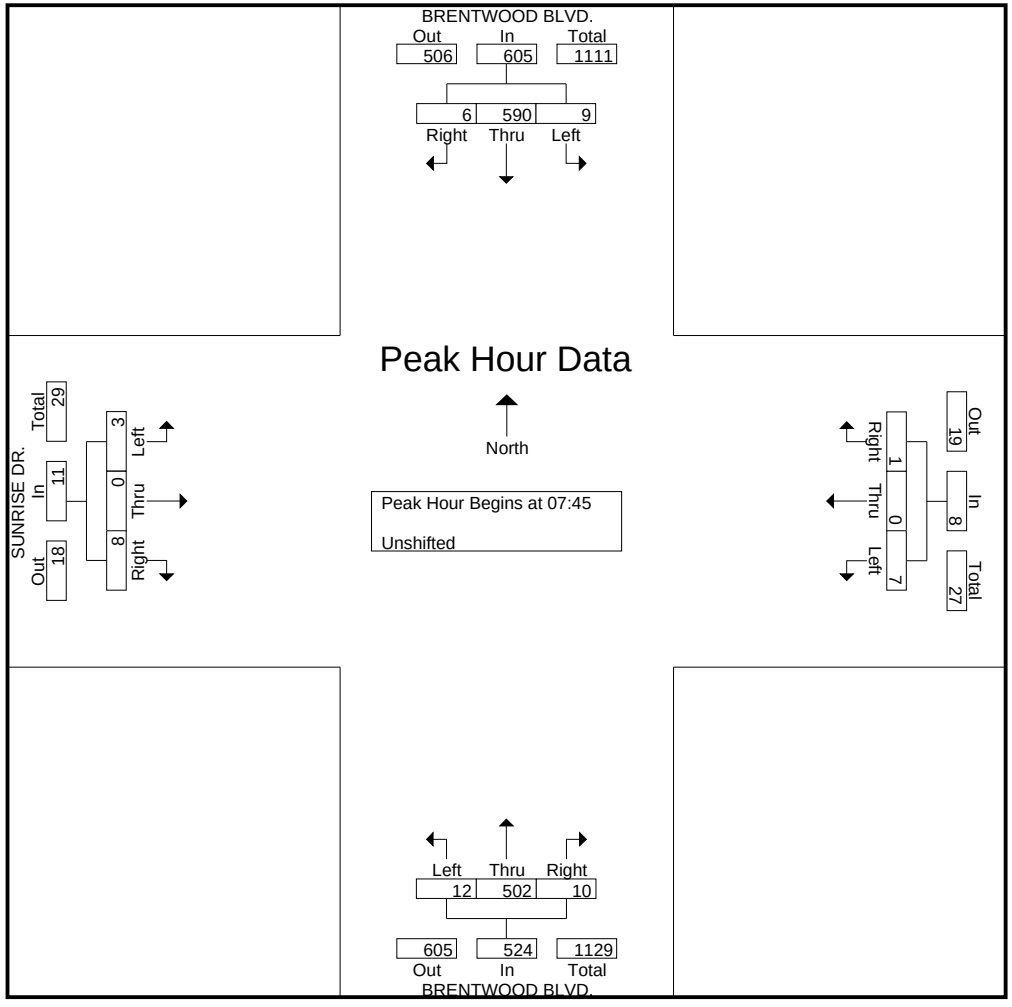
	BRENTWOOD BLVD. Southbound				Westbound				BRENTWOOD BLVD. Northbound				SUNRISE DR. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	2	**156**	0	**158**	0	0	0	0	1	117	3	121	0	0	**3**	3	282
08:00	**3**	149	1	153	1	0	0	1	**5**	**133**	2	**140**	0	0	1	1	**295**
08:15	2	146	**3**	151	**4**	0	0	**4**	4	122	**4**	130	**2**	0	3	**5**	290
08:30	2	139	2	143	2	0	**1**	3	2	130	1	133	1	0	1	2	281
Total Volume	9	590	6	605	7	0	1	8	12	502	10	524	3	0	8	11	1148
% App. Total	1.5	97.5	1		87.5	0	12.5		2.3	95.8	1.9		27.3	0	72.7		
PHF	.750	.946	.500	.957	.438	.000	.250	.500	.600	.944	.625	.936	.375	.000	.667	.550	.973

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-002 BRENTWOOD-SUNRISE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

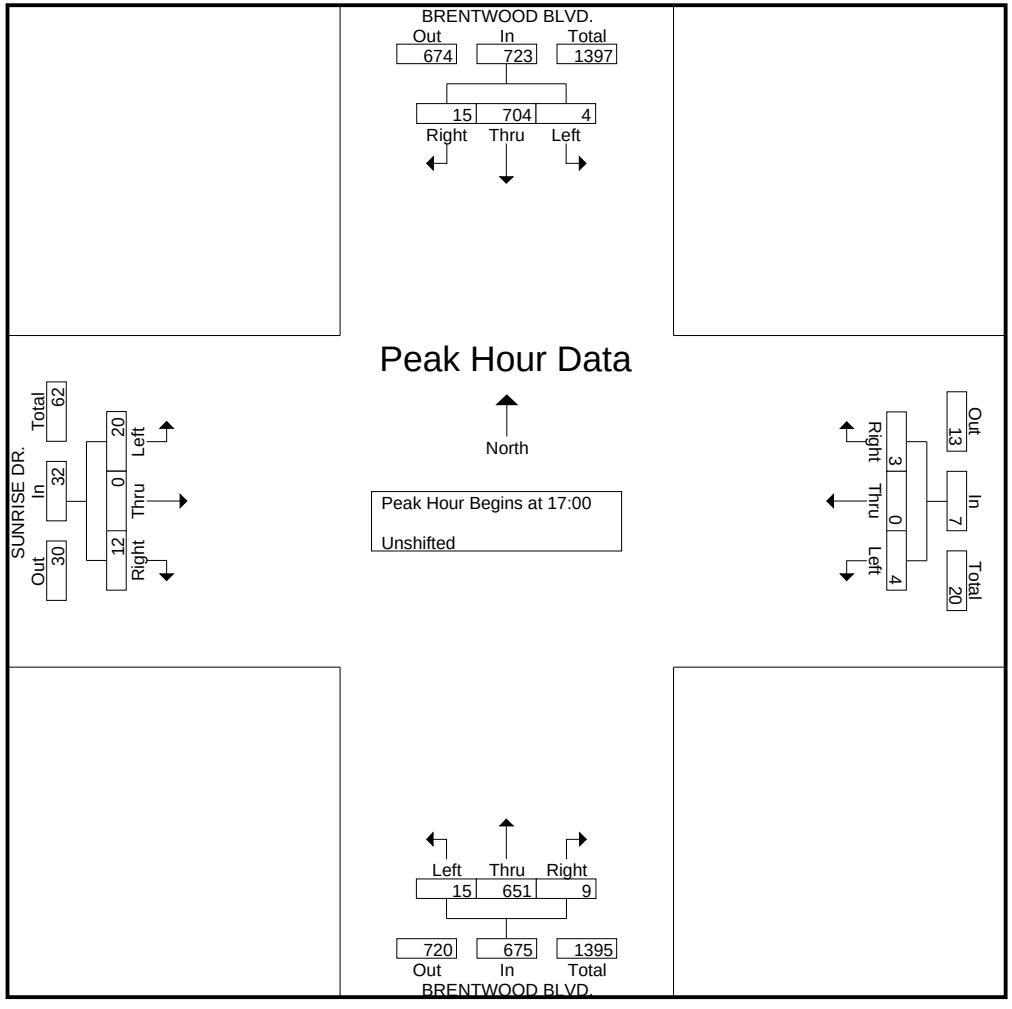
17:00	1	174	1	176	**2**	0	**2**	**4**	1	172	**3**	176	2	0	1	3	359
17:15	**2**	161	5	168	1	0	0	1	**6**	133	3	142	5	0	3	8	319
17:30	1	**188**	**6**	**195**	0	0	0	0	4	163	3	170	**9**	0	**4**	**13**	378
17:45	0	181	3	184	1	0	1	2	4	**183**	0	**187**	4	0	4	8	**381**
Total Volume	4	704	15	723	4	0	3	7	15	651	9	675	20	0	12	32	1437
% App. Total	0.6	97.4	2.1		57.1	0	42.9		2.2	96.4	1.3		62.5	0	37.5		
PHF	.500	.936	.625	.927	.500	.000	.375	.438	.625	.889	.750	.902	.556	.000	.750	.615	.943

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-002 BRENTWOOD-SUNRISE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-003 BRENTWOOD-GREGORY-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				BEVERLY PL. Westbound				BRENTWOOD BLVD. Northbound				GREGORY LN. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	2	81	0	83	0	0	3	3	0	97	1	98	3	0	0	3	187
07:15	1	102	1	104	3	0	3	6	1	88	3	92	1	0	0	1	203
07:30	3	111	4	118	4	0	8	12	1	115	3	119	1	0	1	2	251
07:45	1	157	2	160	3	0	8	11	1	113	3	117	2	0	4	6	294
Total	7	451	7	465	10	0	22	32	3	413	10	426	7	0	5	12	935
08:00	3	146	2	151	1	0	4	5	1	131	2	134	2	0	4	6	296
08:15	3	146	2	151	1	0	1	2	1	130	4	135	2	0	3	5	293
08:30	2	141	0	143	5	0	4	9	0	130	1	131	0	0	1	1	284
08:45	1	122	1	124	2	0	2	4	1	112	3	116	4	0	2	6	250
Total	9	555	5	569	9	0	11	20	3	503	10	516	8	0	10	18	1123
*** BREAK ***																	
16:00	4	172	2	178	1	0	5	6	7	153	3	163	2	0	4	6	353
16:15	2	146	3	151	3	0	10	13	3	142	6	151	0	0	1	1	316
16:30	4	138	0	142	2	0	7	9	0	148	6	154	3	0	1	4	309
16:45	6	150	1	157	3	0	5	8	0	138	4	142	3	0	3	6	313
Total	16	606	6	628	9	0	27	36	10	581	19	610	8	0	9	17	1291
17:00	2	173	3	178	2	0	1	3	5	170	4	179	4	0	1	5	365
17:15	2	166	0	168	2	0	8	10	1	137	4	142	0	0	2	2	322
17:30	6	185	1	192	4	1	8	13	3	158	3	164	3	0	3	6	375
17:45	3	182	1	186	4	0	6	10	2	181	1	184	2	0	2	4	384
Total	13	706	5	724	12	1	23	36	11	646	12	669	9	0	8	17	1446
Grand Total	45	2318	23	2386	40	1	83	124	27	2143	51	2221	32	0	32	64	4795
Apprch %	1.9	97.2	1		32.3	0.8	66.9		1.2	96.5	2.3		50	0	50		
Total %	0.9	48.3	0.5	49.8	0.8	0	1.7	2.6	0.6	44.7	1.1	46.3	0.7	0	0.7	1.3	

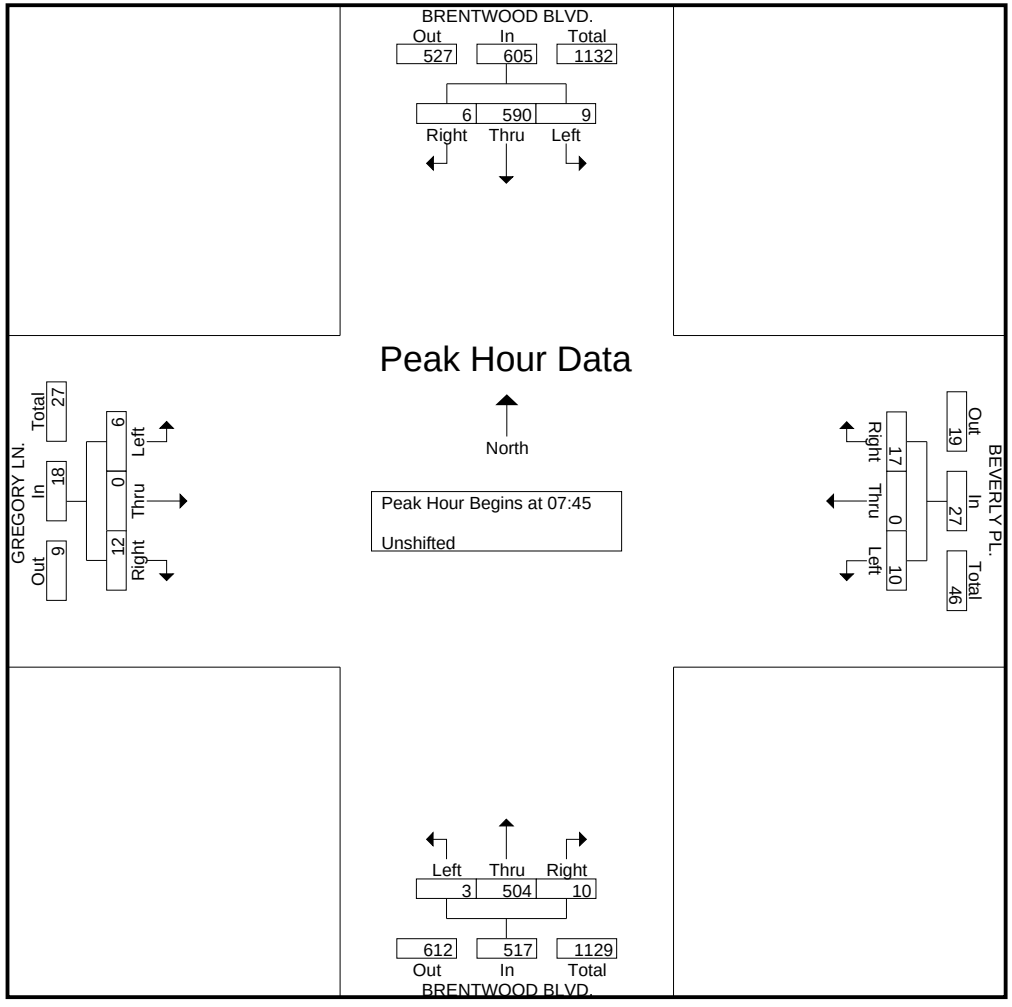
	BRENTWOOD BLVD. Southbound				BEVERLY PL. Westbound				BRENTWOOD BLVD. Northbound				GREGORY LN. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	1	**157**	**2**	**160**	3	0	**8**	**11**	**1**	113	3	117	**2**	0	**4**	**6**	294
08:00	**3**	146	2	151	1	0	4	5	1	**131**	2	134	2	0	4	6	**296**
08:15	3	146	2	151	1	0	1	2	1	130	**4**	**135**	2	0	3	5	293
08:30	2	141	0	143	**5**	0	4	9	0	130	1	131	0	0	1	1	284
Total Volume	9	590	6	605	10	0	17	27	3	504	10	517	6	0	12	18	1167
% App. Total	1.5	97.5	1		37	0	63		0.6	97.5	1.9		33.3	0	66.7		
PHF	.750	.939	.750	.945	.500	.000	.531	.614	.750	.962	.625	.957	.750	.000	.750	.750	.986

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-003 BRENTWOOD-GREGORY-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

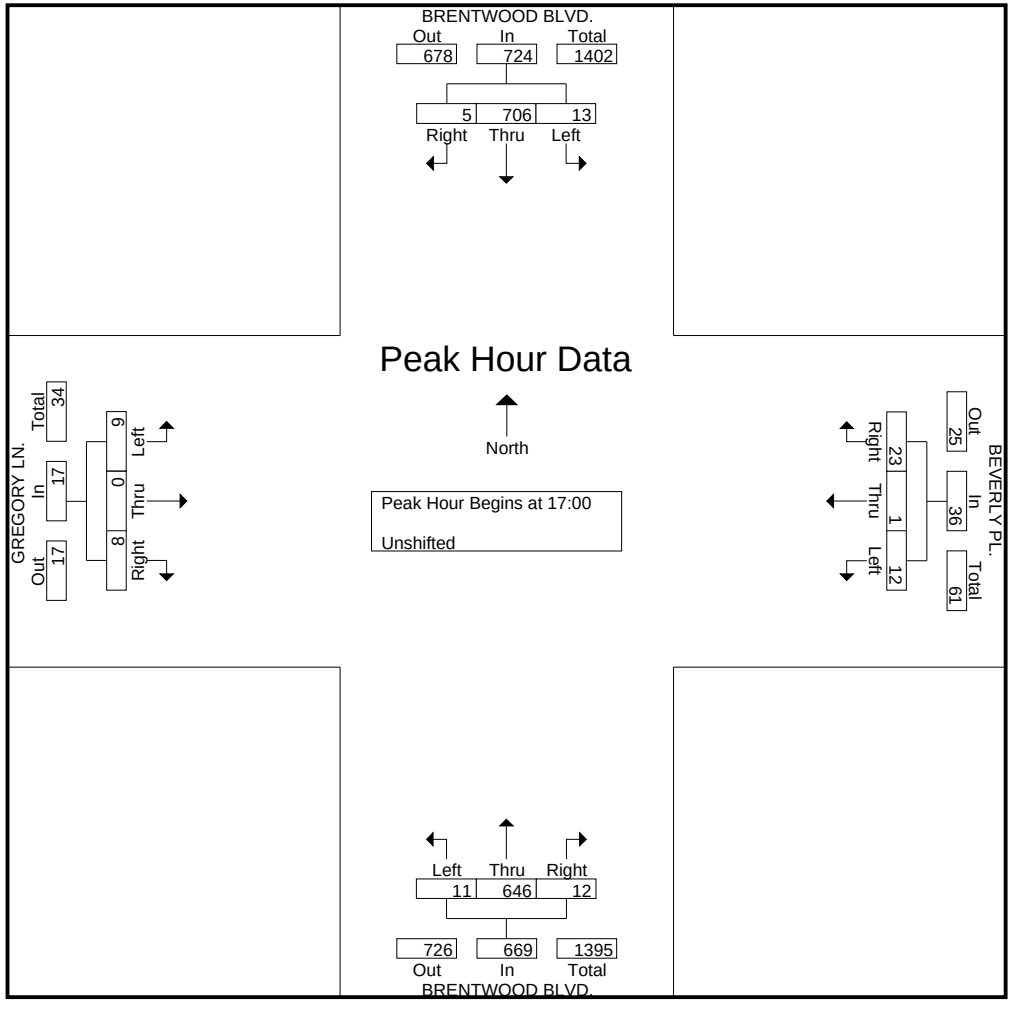
17:00	2	173	**3**	178	2	0	1	3	**5**	170	**4**	179	**4**	0	1	5	365
17:15	2	166	0	168	2	0	**8**	10	1	137	4	142	0	0	2	2	322
17:30	**6**	**185**	1	**192**	**4**	**1**	8	**13**	3	158	3	164	3	0	**3**	**6**	375
17:45	3	182	1	186	4	0	6	10	2	**181**	1	**184**	2	0	2	4	**384**
Total Volume	13	706	5	724	12	1	23	36	11	646	12	669	9	0	8	17	1446
% App. Total	1.8	97.5	0.7		33.3	2.8	63.9		1.6	96.6	1.8		52.9	0	47.1		
PHF	.542	.954	.417	.943	.750	.250	.719	.692	.550	.892	.750	.909	.563	.000	.667	.708	.941

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-003 BRENTWOOD-GREGORY-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-004 BRENTWOOD-HOMECOMING-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				HOMECOMING WAY Westbound				BRENTWOOD BLVD. Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	4	81	0	85	0	0	0	0	0	93	0	93	0	0	0	0	178
07:15	4	106	0	110	0	0	0	0	0	95	2	97	0	0	0	0	207
07:30	7	112	0	119	0	0	1	1	0	124	0	124	0	0	0	0	244
07:45	8	148	0	156	1	0	0	1	0	116	2	118	0	0	0	0	275
Total	23	447	0	470	1	0	1	2	0	428	4	432	0	0	0	0	904
08:00	7	152	0	159	0	0	1	1	0	136	2	138	0	0	0	0	298
08:15	4	147	0	151	0	0	0	0	0	135	2	137	0	0	0	0	288
08:30	12	131	0	143	0	0	0	0	0	132	1	133	0	0	0	0	276
08:45	1	130	0	131	0	0	0	0	0	115	2	117	0	0	0	0	248
Total	24	560	0	584	0	0	1	1	0	518	7	525	0	0	0	0	1110
*** BREAK ***																	
16:00	5	166	0	171	0	0	2	2	0	154	2	156	0	0	0	0	329
16:15	1	151	0	152	0	0	3	3	0	145	1	146	0	0	0	0	301
16:30	4	134	0	138	1	0	0	1	0	160	4	164	0	0	0	0	303
16:45	10	147	0	157	0	0	1	1	0	144	3	147	0	0	0	0	305
Total	20	598	0	618	1	0	6	7	0	603	10	613	0	0	0	0	1238
17:00	1	173	0	174	0	0	1	1	0	179	7	186	0	0	0	0	361
17:15	3	171	0	174	2	0	1	3	0	145	4	149	0	0	0	0	326
17:30	3	183	0	186	0	0	1	1	0	163	1	164	0	0	0	0	351
17:45	8	179	0	187	0	0	1	1	0	181	6	187	0	0	0	0	375
Total	15	706	0	721	2	0	4	6	0	668	18	686	0	0	0	0	1413
Grand Total	82	2311	0	2393	4	0	12	16	0	2217	39	2256	0	0	0	0	4665
Apprch %	3.4	96.6	0		25	0	75		0	98.3	1.7		0	0	0		
Total %	1.8	49.5	0	51.3	0.1	0	0.3	0.3	0	47.5	0.8	48.4	0	0	0	0	

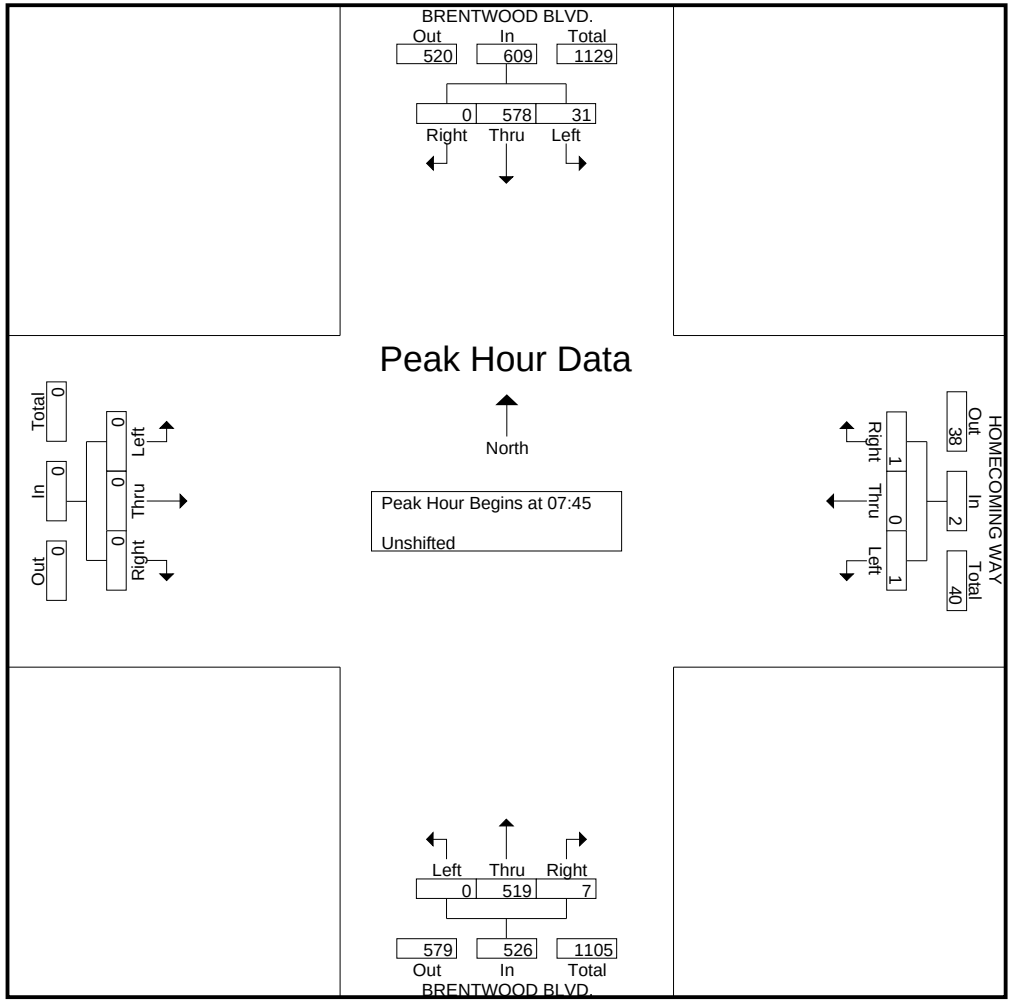
	BRENTWOOD BLVD. Southbound				HOMECOMING WAY Westbound				BRENTWOOD BLVD. Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	8	148	0	156	**1**	0	0	**1**	0	116	**2**	118	0	0	0	0	275
08:00	7	**152**	0	**159**	0	0	**1**	1	0	**136**	2	**138**	0	0	0	0	**298**
08:15	4	147	0	151	0	0	0	0	0	135	2	137	0	0	0	0	288
08:30	**12**	131	0	143	0	0	0	0	0	132	1	133	0	0	0	0	276
Total Volume	31	578	0	609	1	0	1	2	0	519	7	526	0	0	0	0	1137
% App. Total	5.1	94.9	0		50	0	50		0	98.7	1.3		0	0	0		
PHF	.646	.951	.000	.958	.250	.000	.250	.500	.000	.954	.875	.953	.000	.000	.000	.000	.954

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-004 BRENTWOOD-HOMECOMING-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 14:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

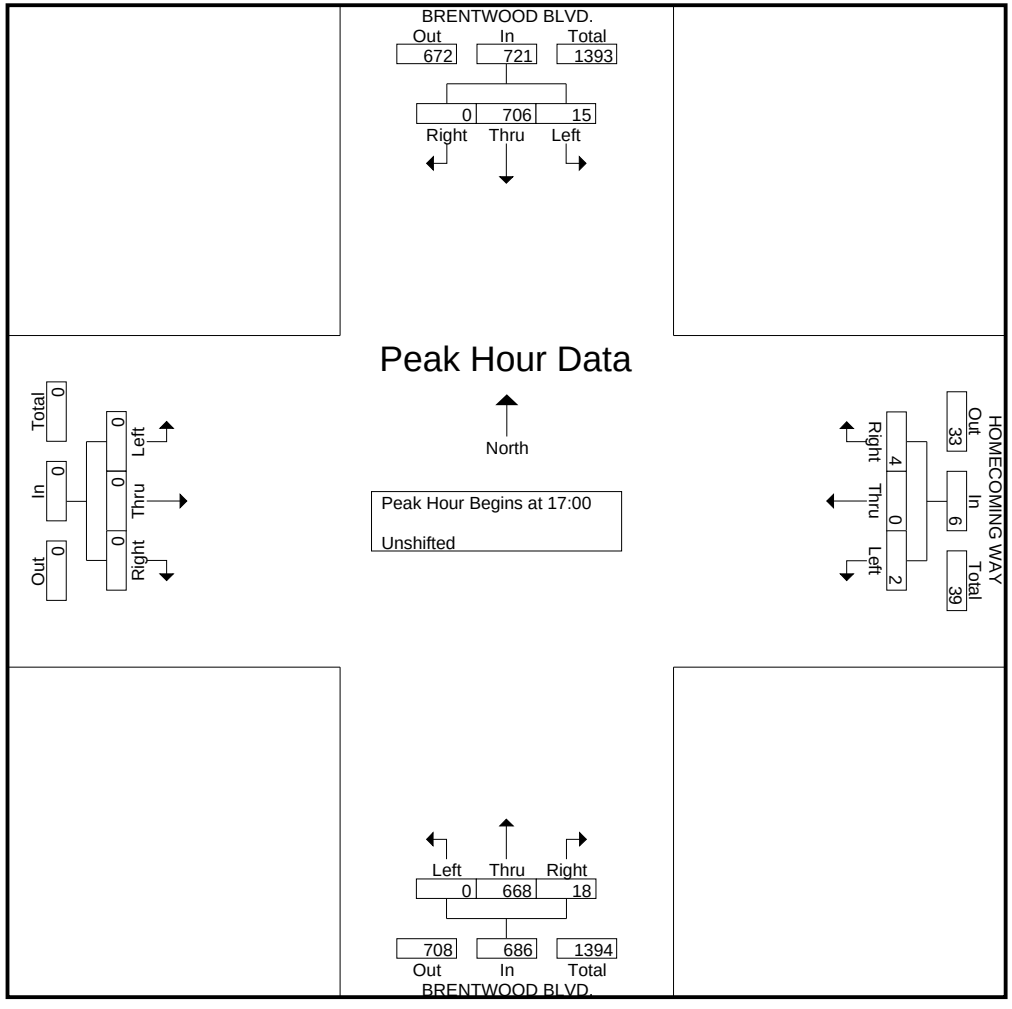
17:00	1	173	0	174	0	0	**1**	1	0	179	**7**	186	0	0	0	0	361
17:15	3	171	0	174	**2**	0	1	**3**	0	145	4	149	0	0	0	0	326
17:30	3	**183**	0	186	0	0	1	1	0	163	1	164	0	0	0	0	351
17:45	**8**	179	0	**187**	0	0	1	1	0	**181**	6	**187**	0	0	0	0	**375**
Total Volume	15	706	0	721	2	0	4	6	0	668	18	686	0	0	0	0	1413
% App. Total	2.1	97.9	0		33.3	0	66.7		0	97.4	2.6		0	0	0		
PHF	.469	.964	.000	.964	.250	.000	1.000	.500	.000	.923	.643	.917	.000	.000	.000	.000	.942

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-004 BRENTWOOD-HOMECOMING-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-005 BRENTWOOD-GRANT-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				SUNSET RD. Westbound				BRENTWOOD BLVD. Northbound				GRANT ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	12	67	2	81	17	5	27	49	2	64	13	79	3	6	4	13	222
07:15	11	87	2	100	30	3	24	57	6	68	14	88	3	5	6	14	259
07:30	14	86	7	107	27	7	40	74	9	76	12	97	4	8	10	22	300
07:45	13	122	11	146	48	17	27	92	25	90	25	140	5	8	19	32	410
Total	50	362	22	434	122	32	118	272	42	298	64	404	15	27	39	81	1191
08:00	16	110	21	147	38	16	24	78	25	94	28	147	17	19	16	52	424
08:15	24	123	5	152	32	6	26	64	5	95	17	117	16	9	22	47	380
08:30	14	110	5	129	30	5	25	60	5	95	28	128	10	6	12	28	345
08:45	11	115	6	132	36	4	26	66	1	87	30	118	3	8	6	17	333
Total	65	458	37	560	136	31	101	268	36	371	103	510	46	42	56	144	1482
*** BREAK ***																	
16:00	25	131	8	164	31	13	31	75	13	121	22	156	3	8	5	16	411
16:15	26	113	10	149	25	6	20	51	10	120	25	155	7	16	12	35	390
16:30	27	112	6	145	28	8	38	74	10	118	38	166	7	12	13	32	417
16:45	18	122	8	148	35	12	25	72	9	118	30	157	5	9	15	29	406
Total	96	478	32	606	119	39	114	272	42	477	115	634	22	45	45	112	1624
17:00	34	131	7	172	32	14	36	82	6	141	25	172	8	9	10	27	453
17:15	28	129	7	164	43	12	20	75	9	121	43	173	6	13	9	28	440
17:30	30	142	6	178	46	13	36	95	9	122	34	165	6	9	15	30	468
17:45	32	139	10	181	42	14	42	98	8	140	54	202	6	12	14	32	513
Total	124	541	30	695	163	53	134	350	32	524	156	712	26	43	48	117	1874
Grand Total	335	1839	121	2295	540	155	467	1162	152	1670	438	2260	109	157	188	454	6171
Apprch %	14.6	80.1	5.3		46.5	13.3	40.2		6.7	73.9	19.4		24	34.6	41.4		
Total %	5.4	29.8	2	37.2	8.8	2.5	7.6	18.8	2.5	27.1	7.1	36.6	1.8	2.5	3	7.4	

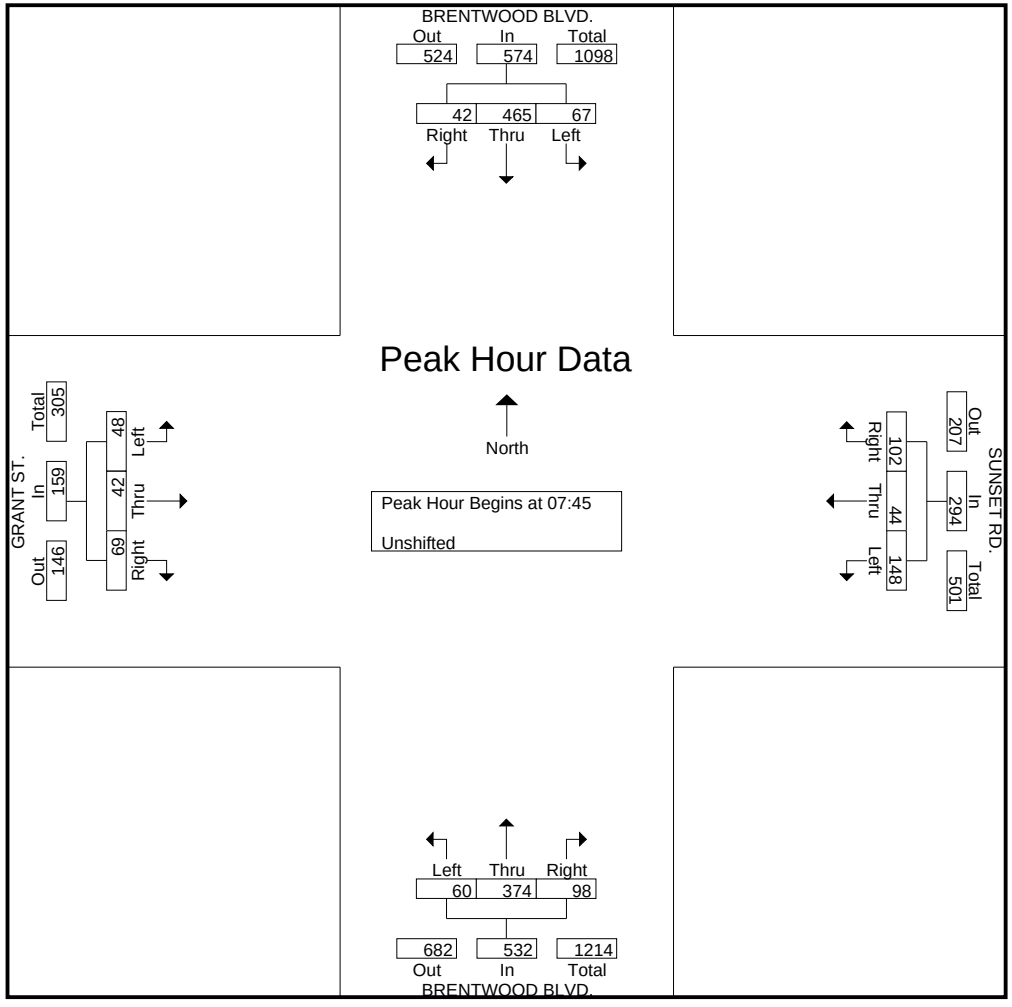
	BRENTWOOD BLVD. Southbound				SUNSET RD. Westbound				BRENTWOOD BLVD. Northbound				GRANT ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	13	122	11	146	**48**	**17**	**27**	**92**	**25**	90	25	140	5	8	19	32	410
08:00	16	110	**21**	147	38	16	24	78	25	94	**28**	**147**	**17**	**19**	16	**52**	**424**
08:15	**24**	**123**	5	**152**	32	6	26	64	5	**95**	17	117	16	9	**22**	47	380
08:30	14	110	5	129	30	5	25	60	5	95	28	128	10	6	12	28	345
Total Volume	67	465	42	574	148	44	102	294	60	374	98	532	48	42	69	159	1559
% App. Total	11.7	81	7.3		50.3	15	34.7		11.3	70.3	18.4		30.2	26.4	43.4		
PHF	.698	.945	.500	.944	.771	.647	.944	.799	.600	.984	.875	.905	.706	.553	.784	.764	.919

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-005 BRENTWOOD-GRANT-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

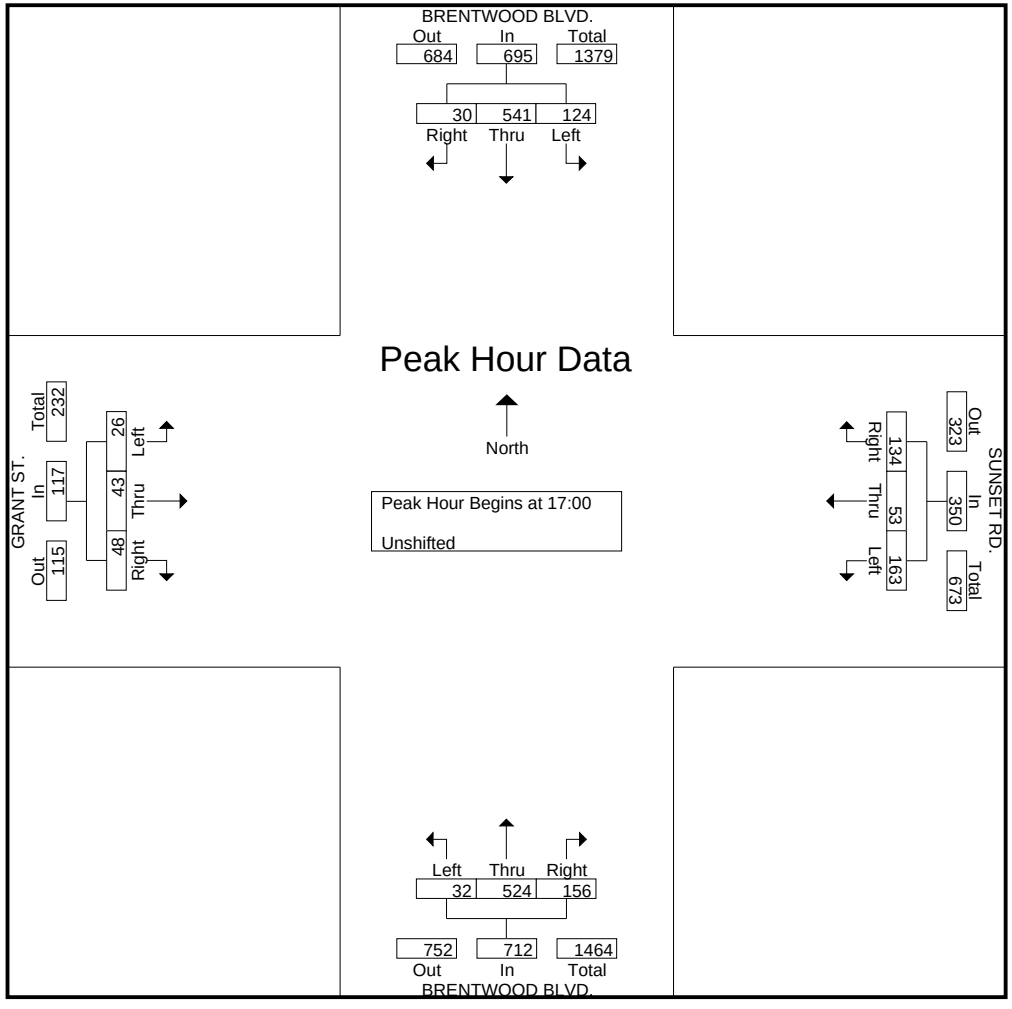
17:00	**34**	131	7	172	32	**14**	36	82	6	**141**	25	172	**8**	9	10	27	453
17:15	28	129	7	164	43	12	20	75	**9**	121	43	173	6	**13**	9	28	440
17:30	30	**142**	6	178	**46**	13	36	95	9	122	34	165	6	9	**15**	30	468
17:45	32	139	**10**	**181**	42	14	**42**	**98**	8	140	**54**	**202**	6	12	14	**32**	**513**
Total Volume	124	541	30	695	163	53	134	350	32	524	156	712	26	43	48	117	1874
% App. Total	17.8	77.8	4.3		46.6	15.1	38.3		4.5	73.6	21.9		22.2	36.8	41		
PHF	.912	.952	.750	.960	.886	.946	.798	.893	.889	.929	.722	.881	.813	.827	.800	.914	.913

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-005 BRENTWOOD-GRANT-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-006 BRENTWOOD-HAVENWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				SUNSET CT. Westbound				BRENTWOOD BLVD. Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	87	0	87	0	0	0	0	0	83	0	83	0	0	0	0	170
07:15	0	119	0	119	0	0	0	0	0	88	0	88	0	0	0	0	207
07:30	2	118	0	120	0	0	0	0	0	96	0	96	0	0	0	0	216
07:45	0	190	0	190	0	0	0	0	0	144	0	144	0	0	0	0	334
Total	2	514	0	516	0	0	0	0	0	411	0	411	0	0	0	0	927
08:00	0	172	0	172	0	0	0	0	0	153	0	153	0	0	0	0	325
08:15	0	185	0	185	0	0	0	0	0	122	0	122	0	0	0	0	307
08:30	0	144	0	144	0	0	1	1	0	117	1	118	0	0	0	0	263
08:45	0	156	0	156	0	0	0	0	0	0	0	0	0	0	0	0	156
Total	0	657	0	657	0	0	1	1	0	392	1	393	0	0	0	0	1051
*** BREAK ***																	
16:00	0	174	0	174	0	0	0	0	0	155	0	155	0	0	0	0	329
16:15	0	151	0	151	0	0	0	0	0	155	0	155	0	0	0	0	306
16:30	0	157	0	157	0	0	0	0	0	166	0	166	0	0	0	0	323
16:45	0	166	0	166	0	0	0	0	0	158	0	158	0	0	0	0	324
Total	0	648	0	648	0	0	0	0	0	634	0	634	0	0	0	0	1282
17:00	0	181	0	181	0	0	0	0	0	169	0	169	0	0	0	0	350
17:15	0	185	0	185	0	0	1	1	0	174	0	174	0	0	0	0	360
17:30	0	210	0	210	0	0	0	0	0	166	0	166	0	0	0	0	376
17:45	0	204	0	204	0	0	0	0	0	204	0	204	0	0	0	0	408
Total	0	780	0	780	0	0	1	1	0	713	0	713	0	0	0	0	1494
Grand Total	2	2599	0	2601	0	0	2	2	0	2150	1	2151	0	0	0	0	4754
Apprch %	0.1	99.9	0		0	0	100		0	100	0		0	0	0		
Total %	0	54.7	0	54.7	0	0	0	0	0	45.2	0	45.2	0	0	0	0	

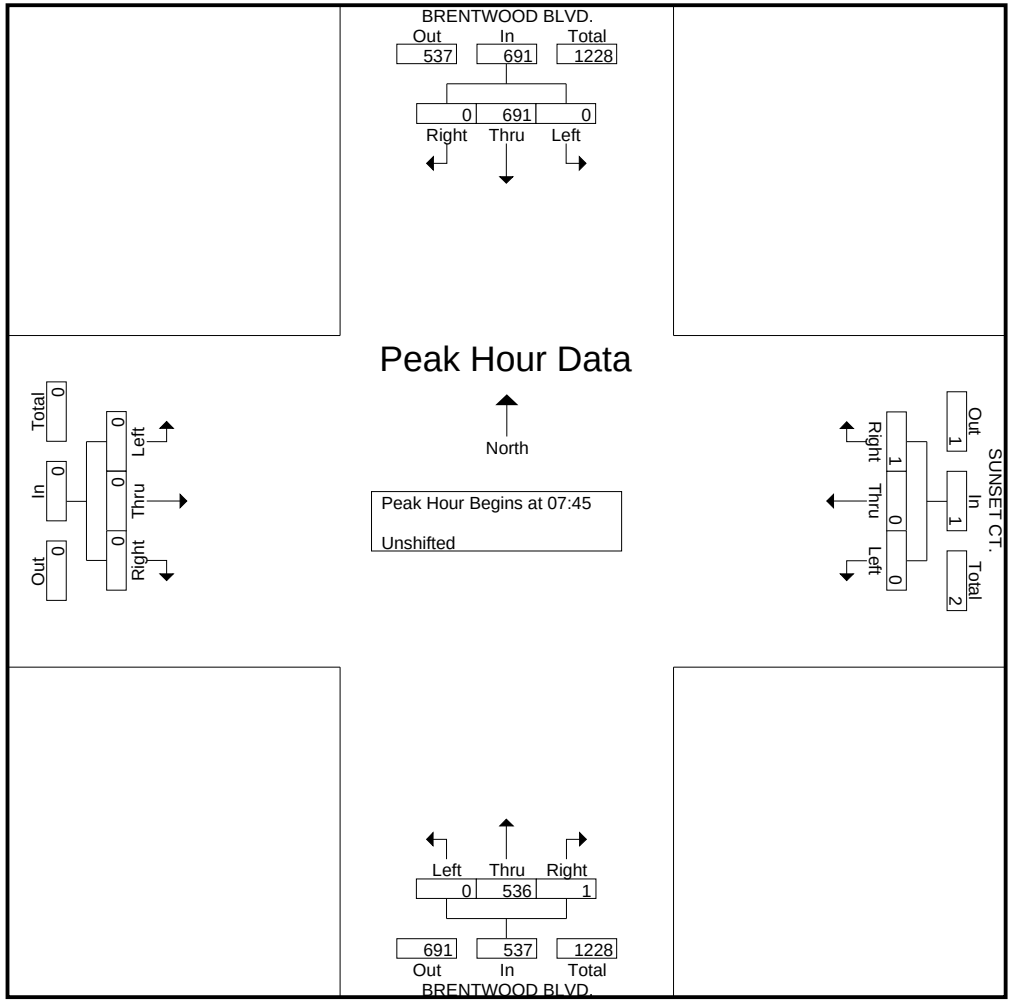
	BRENTWOOD BLVD. Southbound				SUNSET CT. Westbound				BRENTWOOD BLVD. Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	0	**190**	0	**190**	0	0	0	0	0	144	0	144	0	0	0	0	**334**
08:00	0	172	0	172	0	0	0	0	0	**153**	0	**153**	0	0	0	0	325
08:15	0	185	0	185	0	0	0	0	0	122	0	122	0	0	0	0	307
08:30	0	144	0	144	0	0	**1**	**1**	0	117	**1**	118	0	0	0	0	263
Total Volume	0	691	0	691	0	0	1	1	0	536	1	537	0	0	0	0	1229
% App. Total	0	100	0		0	0	100		0	99.8	0.2		0	0	0		
PHF	.000	.909	.000	.909	.000	.000	.250	.250	.000	.876	.250	.877	.000	.000	.000	.000	.920

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

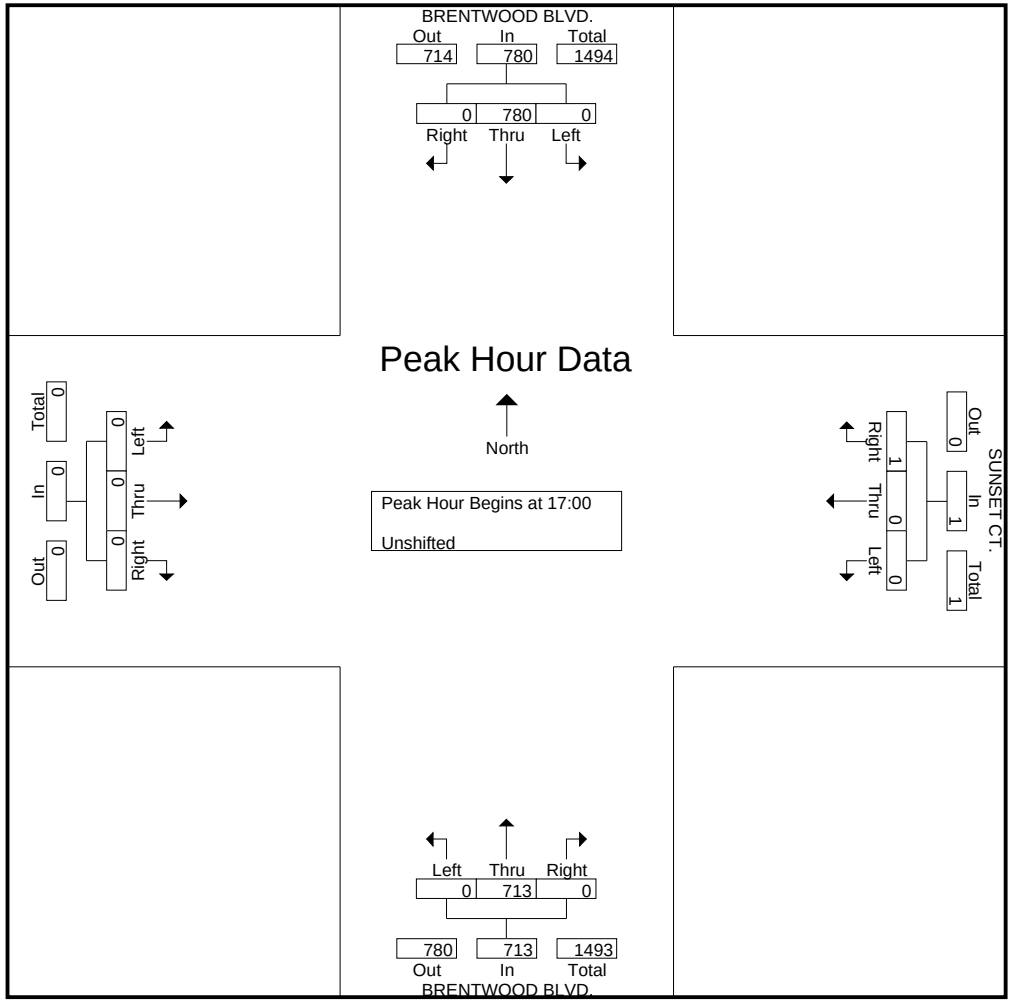
File Name : 08-7637-006 BRENTWOOD-HAVENWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	181	0	181	0	0	0	0	0	169	0	169	0	0	0	0	350
17:15	0	185	0	185	0	0	**1**	**1**	0	174	0	174	0	0	0	0	360
17:30	0	**210**	0	**210**	0	0	0	0	0	166	0	166	0	0	0	0	376
17:45	0	204	0	204	0	0	0	0	0	**204**	0	**204**	0	0	0	0	**408**
Total Volume	0	780	0	780	0	0	1	1	0	713	0	713	0	0	0	0	1494
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0		
PHF	.000	.929	.000	.929	.000	.000	.250	.250	.000	.874	.000	.874	.000	.000	.000	.000	.915

Peak Hour Data



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-007 BRENTWOOD-HAVENWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				HAVENWOOD AVE. Westbound				BRENTWOOD BLVD. Northbound				HAVENWOOD CT. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	86	1	87	3	0	2	5	0	80	0	80	1	0	1	2	174
07:15	0	119	0	119	4	0	1	5	0	87	2	89	0	0	0	0	213
07:30	0	118	0	118	8	0	8	16	0	98	3	101	0	0	1	1	236
07:45	1	188	1	190	6	0	5	11	1	138	0	139	1	0	2	3	343
Total	1	511	2	514	21	0	16	37	1	403	5	409	2	0	4	6	966
08:00	6	162	4	172	6	1	4	11	2	149	13	164	0	0	2	2	349
08:15	4	175	6	185	8	0	2	10	4	121	4	129	0	0	2	2	326
08:30	0	140	4	144	4	1	1	6	3	119	4	126	3	0	8	11	287
08:45	1	155	0	156	1	1	0	2	0	115	4	119	2	1	1	4	281
Total	11	632	14	657	19	3	7	29	9	504	25	538	5	1	13	19	1243
*** BREAK ***																	
16:00	6	166	2	174	3	0	4	7	2	151	4	157	0	0	1	1	339
16:15	4	144	3	151	3	0	2	5	9	151	6	166	2	0	8	10	332
16:30	1	155	1	157	3	0	1	4	0	164	8	172	1	0	5	6	339
16:45	6	156	4	166	4	0	4	8	2	153	9	164	1	0	0	1	339
Total	17	621	10	648	13	0	11	24	13	619	27	659	4	0	14	18	1349
17:00	5	175	1	181	1	0	1	2	1	167	8	176	1	0	0	1	360
17:15	5	177	3	185	4	0	1	5	0	173	5	178	0	0	1	1	369
17:30	6	201	3	210	3	0	5	8	0	160	6	166	0	1	2	3	387
17:45	8	193	3	204	4	0	2	6	2	202	8	212	0	0	2	2	424
Total	24	746	10	780	12	0	9	21	3	702	27	732	1	1	5	7	1540
Grand Total	53	2510	36	2599	65	3	43	111	26	2228	84	2338	12	2	36	50	5098
Apprch %	2	96.6	1.4		58.6	2.7	38.7		1.1	95.3	3.6		24	4	72		
Total %	1	49.2	0.7	51	1.3	0.1	0.8	2.2	0.5	43.7	1.6	45.9	0.2	0	0.7	1	

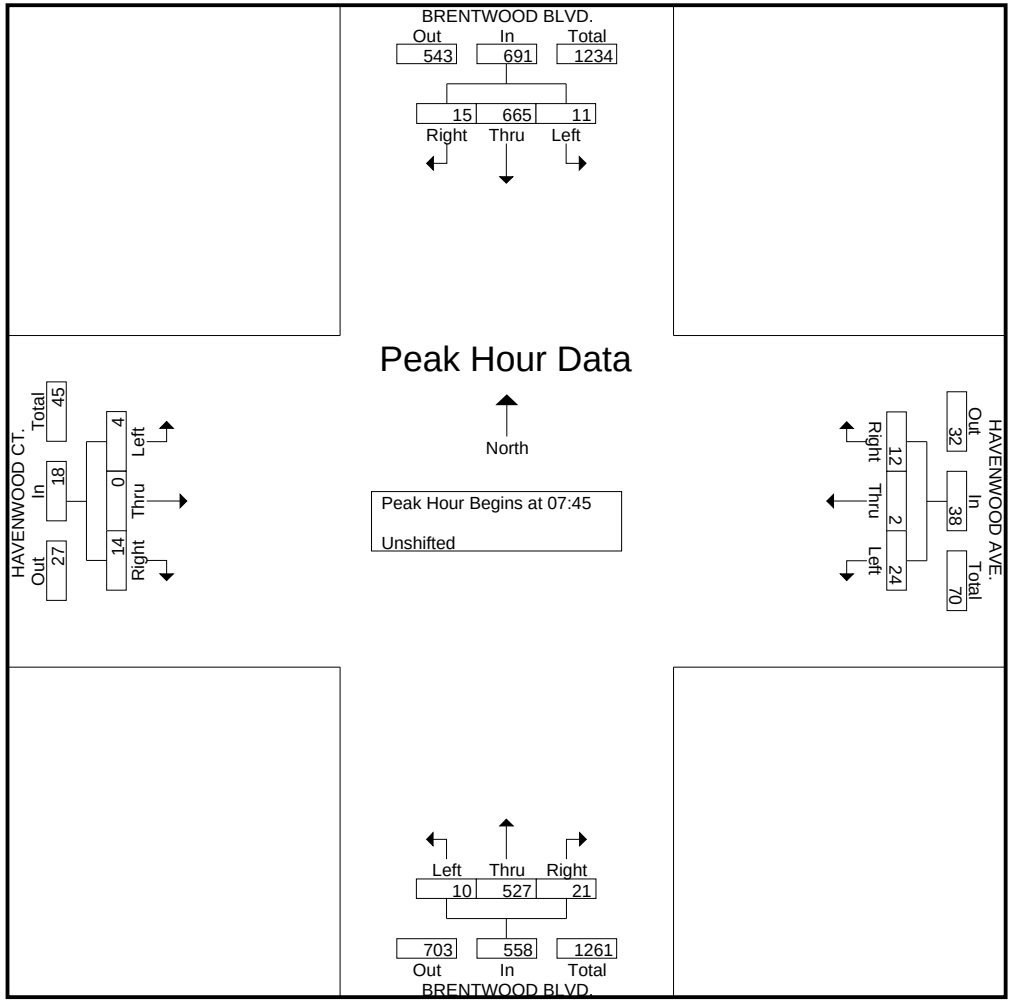
	BRENTWOOD BLVD. Southbound				HAVENWOOD AVE. Westbound				BRENTWOOD BLVD. Northbound				HAVENWOOD CT. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	1	**188**	1	**190**	6	0	**5**	**11**	1	138	0	139	1	0	2	3	343
08:00	**6**	162	4	172	6	**1**	4	11	2	**149**	**13**	**164**	0	0	2	2	**349**
08:15	4	175	**6**	185	**8**	0	2	10	**4**	121	4	129	0	0	2	2	326
08:30	0	140	4	144	4	1	1	6	3	119	4	126	**3**	0	**8**	**11**	287
Total Volume	11	665	15	691	24	2	12	38	10	527	21	558	4	0	14	18	1305
% App. Total	1.6	96.2	2.2		63.2	5.3	31.6		1.8	94.4	3.8		22.2	0	77.8		
PHF	.458	.884	.625	.909	.750	.500	.600	.864	.625	.884	.404	.851	.333	.000	.438	.409	.935

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-007 BRENTWOOD-HAVENWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

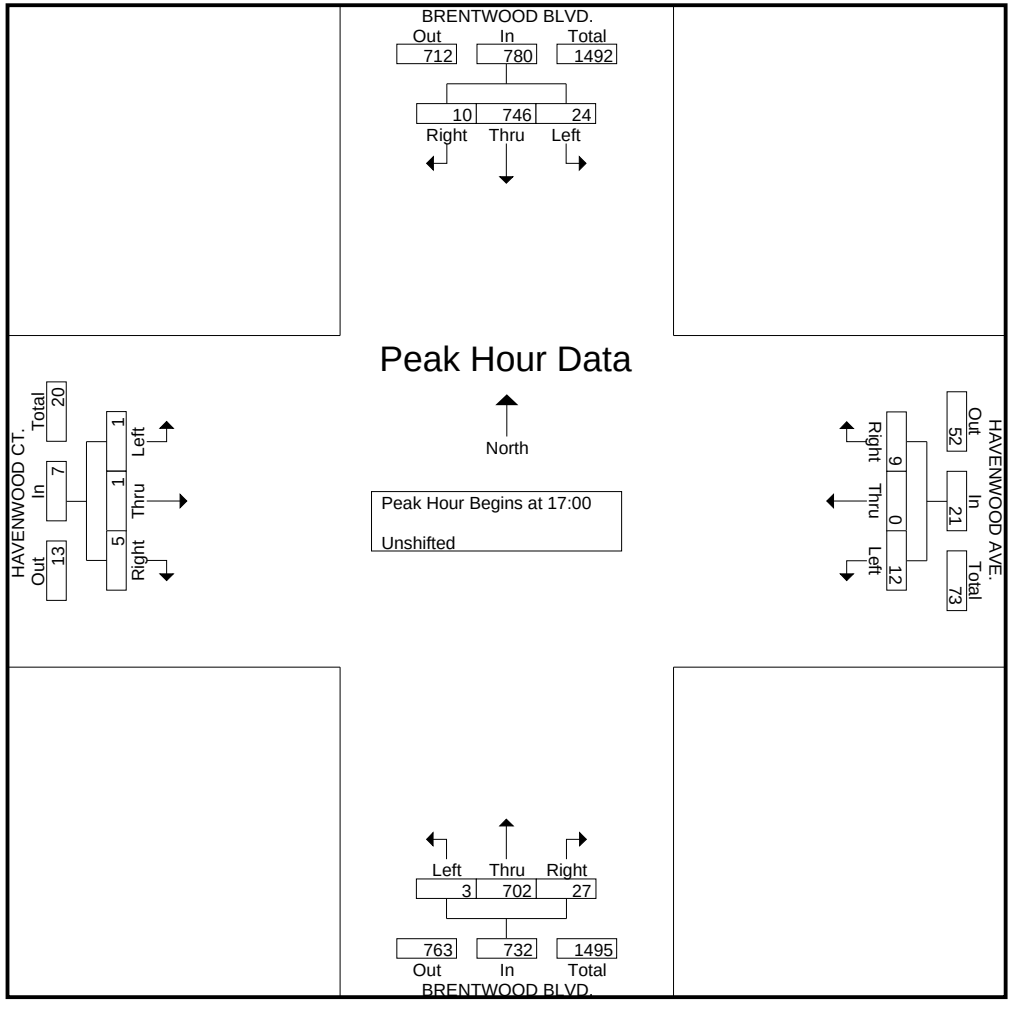
17:00	5	175	1	181	1	0	1	2	1	167	**8**	176	**1**	0	0	1	360
17:15	5	177	**3**	185	**4**	0	1	5	0	173	5	178	0	0	1	1	369
17:30	6	**201**	3	**210**	3	0	**5**	**8**	0	160	6	166	0	**1**	**2**	**3**	387
17:45	**8**	193	3	204	4	0	2	6	**2**	**202**	8	**212**	0	0	2	2	**424**
Total Volume	24	746	10	780	12	0	9	21	3	702	27	732	1	1	5	7	1540
% App. Total	3.1	95.6	1.3		57.1	0	42.9		0.4	95.9	3.7		14.3	14.3	71.4		
PHF	.750	.928	.833	.929	.750	.000	.450	.656	.375	.869	.844	.863	.250	.250	.625	.583	.908

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-007 BRENTWOOD-HAVENWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

SACRAMENTO

File Name : 08-7637-008 BRENTWOOD-APPLEWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound					APPLEWOOD COMMON Westbound					BRENTWOOD BLVD. Northbound					APPLEWOOD CT. Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	0	96	3	0	99	6	1	2	0	9	1	76	0	0	77	2	0	3	0	5	190
07:15	0	125	1	0	126	7	0	2	0	9	0	90	0	0	90	2	0	2	0	4	229
07:30	0	130	2	0	132	6	0	1	0	7	6	99	0	0	105	1	0	4	0	5	249
07:45	0	194	5	0	199	8	0	2	0	10	4	123	2	0	129	6	0	7	0	13	351
Total	0	545	11	0	556	27	1	7	0	35	11	388	2	0	401	11	0	16	0	27	1019
08:00	1	169	2	0	172	10	0	4	0	14	4	161	3	0	168	10	0	3	0	13	367
08:15	1	174	2	0	177	5	0	1	0	6	4	121	6	0	131	4	0	6	0	10	324
08:30	0	148	1	0	149	5	0	3	0	8	3	117	3	0	123	3	0	5	0	8	288
08:45	1	153	0	0	154	5	0	2	0	7	1	115	1	0	117	1	0	1	0	2	280
Total	3	644	5	0	652	25	0	10	0	35	12	514	13	0	539	18	0	15	0	33	1259
*** BREAK ***																					
16:00	2	167	2	0	171	7	0	1	0	8	4	159	9	0	172	1	0	5	0	6	357
16:15	1	153	2	0	156	6	0	2	0	8	8	168	12	0	188	2	0	6	0	8	360
16:30	3	160	3	0	166	7	0	2	0	9	5	169	10	0	184	3	0	4	0	7	366
16:45	5	157	1	0	163	5	0	2	0	7	3	158	12	0	173	1	0	5	0	6	349
Total	11	637	8	0	656	25	0	7	0	32	20	654	43	0	717	7	0	20	0	27	1432
17:00	3	169	2	0	174	4	0	2	0	6	3	176	9	0	188	1	0	6	0	7	375
17:15	3	178	3	0	184	6	0	3	0	9	5	176	7	0	188	1	0	8	0	9	390
17:30	1	193	5	0	199	13	1	1	0	15	10	166	7	0	183	0	0	4	0	4	401
17:45	3	187	4	0	194	8	0	1	0	9	3	211	8	0	222	0	0	5	0	5	430
Total	10	727	14	0	751	31	1	7	0	39	21	729	31	0	781	2	0	23	0	25	1596
Grand Total	24	2553	38	0	2615	108	2	31	0	141	64	2285	89	0	2438	38	0	74	0	112	5306
Apprch %	0.9	97.6	1.5	0		76.6	1.4	22	0		2.6	93.7	3.7	0		33.9	0	66.1	0		
Total %	0.5	48.1	0.7	0	49.3	2	0	0.6	0	2.7	1.2	43.1	1.7	0	45.9	0.7	0	1.4	0	2.1	

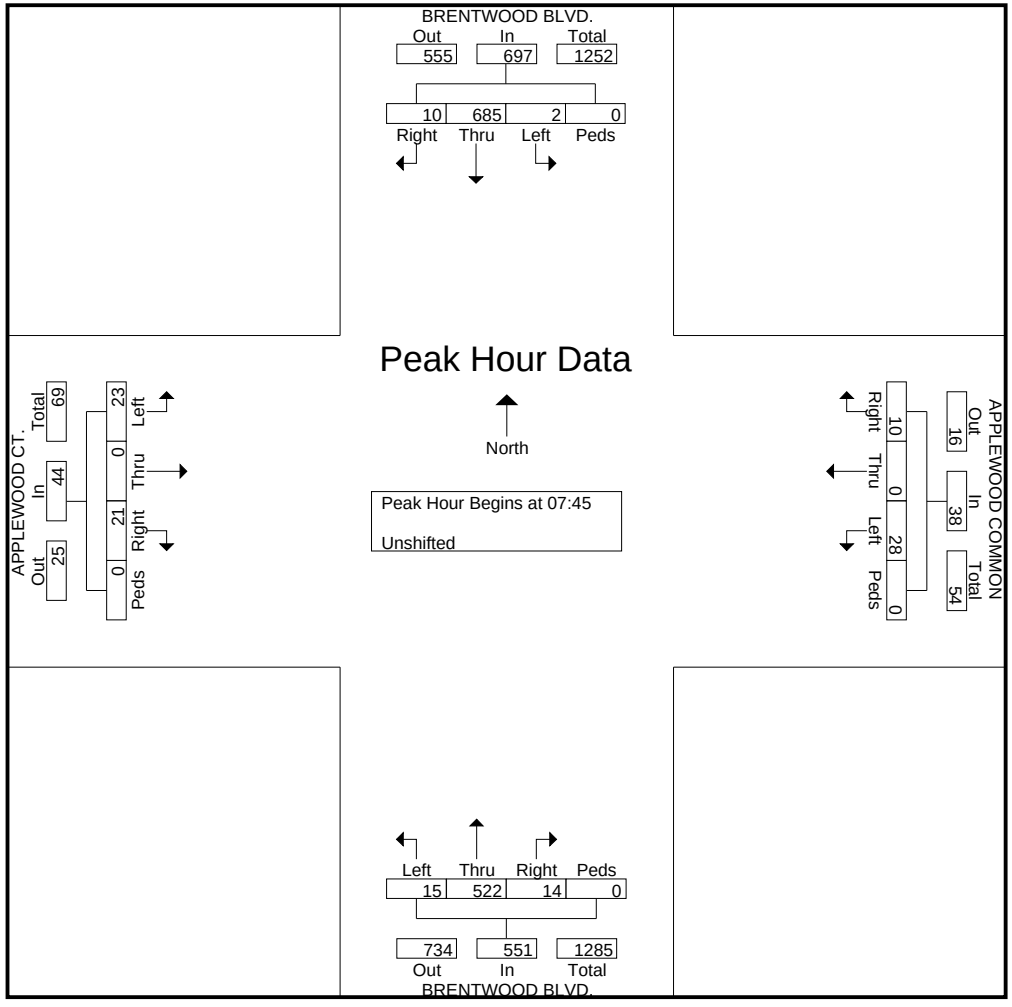
	BRENTWOOD BLVD. Southbound					APPLEWOOD COMMON Westbound					BRENTWOOD BLVD. Northbound					APPLEWOOD CT. Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45																					
07:45	0	**194**	**5**	0	**199**	8	0	2	0	10	**4**	123	2	0	129	6	0	**7**	0	**13**	351
08:00	**1**	169	2	0	172	**10**	0	**4**	0	**14**	4	**161**	3	0	**168**	**10**	0	3	0	13	**367**
08:15	1	174	2	0	177	5	0	1	0	6	4	121	**6**	0	131	4	0	6	0	10	324
08:30	0	148	1	0	149	5	0	3	0	8	3	117	3	0	123	3	0	5	0	8	288
Total Volume	2	685	10	0	697	28	0	10	0	38	15	522	14	0	551	23	0	21	0	44	1330
% App. Total	0.3	98.3	1.4	0		73.7	0	26.3	0		2.7	94.7	2.5	0		52.3	0	47.7	0		
PHF	.500	.883	.500	.000	.876	.700	.000	.625	.000	.679	.938	.811	.583	.000	.820	.575	.000	.750	.000	.846	.906

All Traffic Data

(916) 771-8700
F (916) 786-2879

SACRAMENTO

File Name : 08-7637-008 BRENTWOOD-APPLEWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

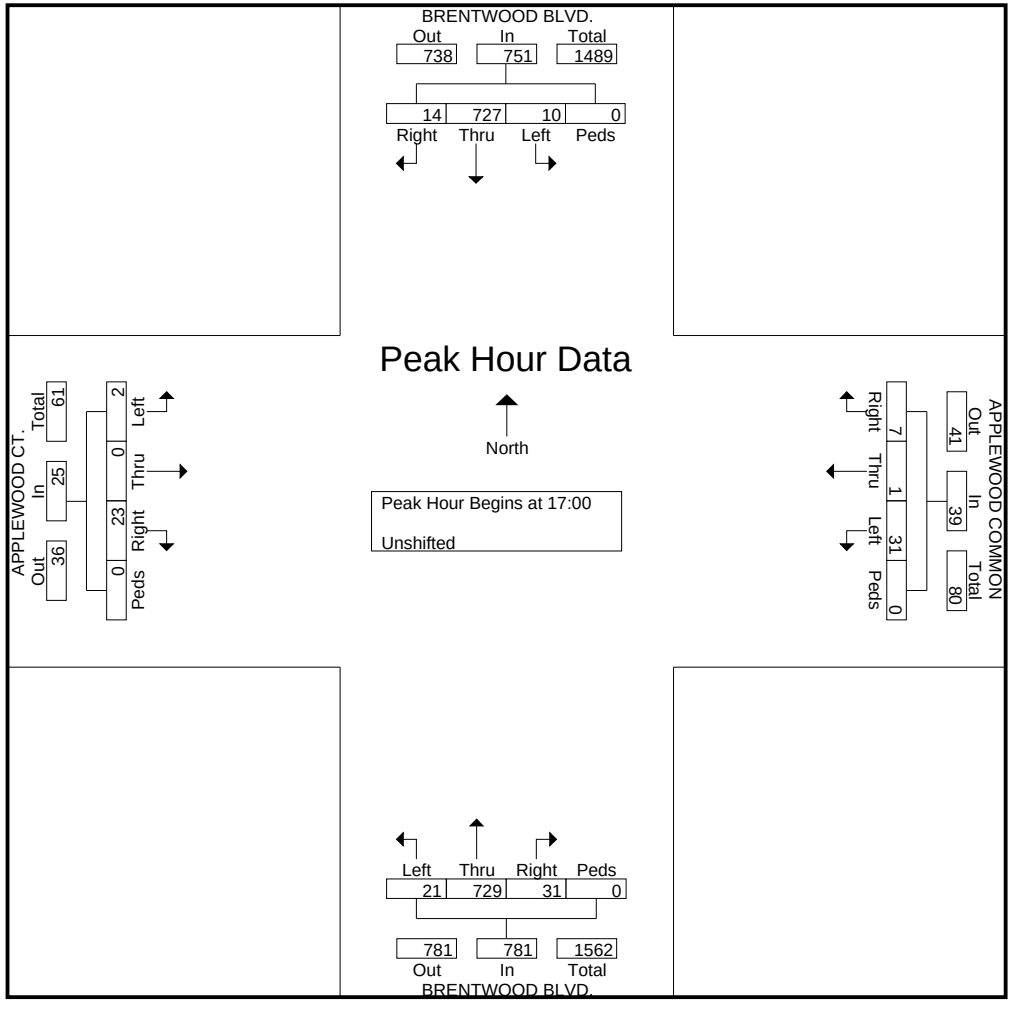
17:00	**3**	169	2	0	174	4	0	2	0	6	3	176	**9**	0	188	**1**	0	6	0	7	375
17:15	3	178	3	0	184	6	0	**3**	0	9	5	176	7	0	188	1	0	**8**	0	**9**	390
17:30	1	**193**	**5**	0	**199**	**13**	**1**	1	0	**15**	**10**	166	7	0	183	0	0	4	0	4	401
17:45	3	187	4	0	194	8	0	1	0	9	3	**211**	8	0	**222**	0	0	5	0	5	**430**
Total Volume	10	727	14	0	751	31	1	7	0	39	21	729	31	0	781	2	0	23	0	25	1596
% App. Total	1.3	96.8	1.9	0		79.5	2.6	17.9	0		2.7	93.3	4	0		8	0	92	0		
PHF	.833	.942	.700	.000	.943	.596	.250	.583	.000	.650	.525	.864	.861	.000	.880	.500	.000	.719	.000	.694	.928

All Traffic Data

(916) 771-8700
F (916) 786-2879

SACRAMENTO

File Name : 08-7637-008 BRENTWOOD-APPLEWOOD-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-009 BRENTWOOD-SAND CREEK-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				Westbound				BRENTWOOD BLVD. Northbound				SAND CREEK RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	2	81	18	101	0	0	0	0	25	64	0	89	11	0	6	17	207
07:15	1	81	32	114	0	0	0	0	18	69	0	87	17	0	6	23	224
07:30	1	116	20	137	0	0	0	0	23	77	0	100	15	0	14	29	266
07:45	3	144	32	179	0	0	0	0	43	101	0	144	23	0	24	47	370
Total	7	422	102	531	0	0	0	0	109	311	0	420	66	0	50	116	1067
08:00	2	145	44	191	0	0	0	0	41	129	0	170	37	0	27	64	425
08:15	4	137	29	170	0	0	0	0	37	81	0	118	38	0	23	61	349
08:30	9	121	29	159	0	0	0	0	26	98	0	124	21	0	18	39	322
08:45	3	126	26	155	0	0	0	0	46	88	0	134	31	0	26	57	346
Total	18	529	128	675	0	0	0	0	150	396	0	546	127	0	94	221	1442
*** BREAK ***																	
16:00	4	139	37	180	0	0	0	0	47	136	0	183	42	0	45	87	450
16:15	10	126	28	164	0	0	0	0	53	132	0	185	50	0	42	92	441
16:30	7	124	41	172	0	0	0	0	32	141	0	173	43	0	36	79	424
16:45	3	142	33	178	0	0	0	0	48	122	0	170	50	0	32	82	430
Total	24	531	139	694	0	0	0	0	180	531	0	711	185	0	155	340	1745
17:00	8	140	36	184	0	0	0	0	49	133	0	182	49	0	47	96	462
17:15	11	163	39	213	0	0	0	0	44	136	0	180	48	0	27	75	468
17:30	7	165	44	216	0	0	0	0	46	135	0	181	34	0	50	84	481
17:45	8	130	52	190	0	0	0	0	41	160	0	201	59	0	42	101	492
Total	34	598	171	803	0	0	0	0	180	564	0	744	190	0	166	356	1903
Grand Total	83	2080	540	2703	0	0	0	0	619	1802	0	2421	568	0	465	1033	6157
Apprch %	3.1	77	20		0	0	0		25.6	74.4	0		55	0	45		
Total %	1.3	33.8	8.8	43.9	0	0	0	0	10.1	29.3	0	39.3	9.2	0	7.6	16.8	

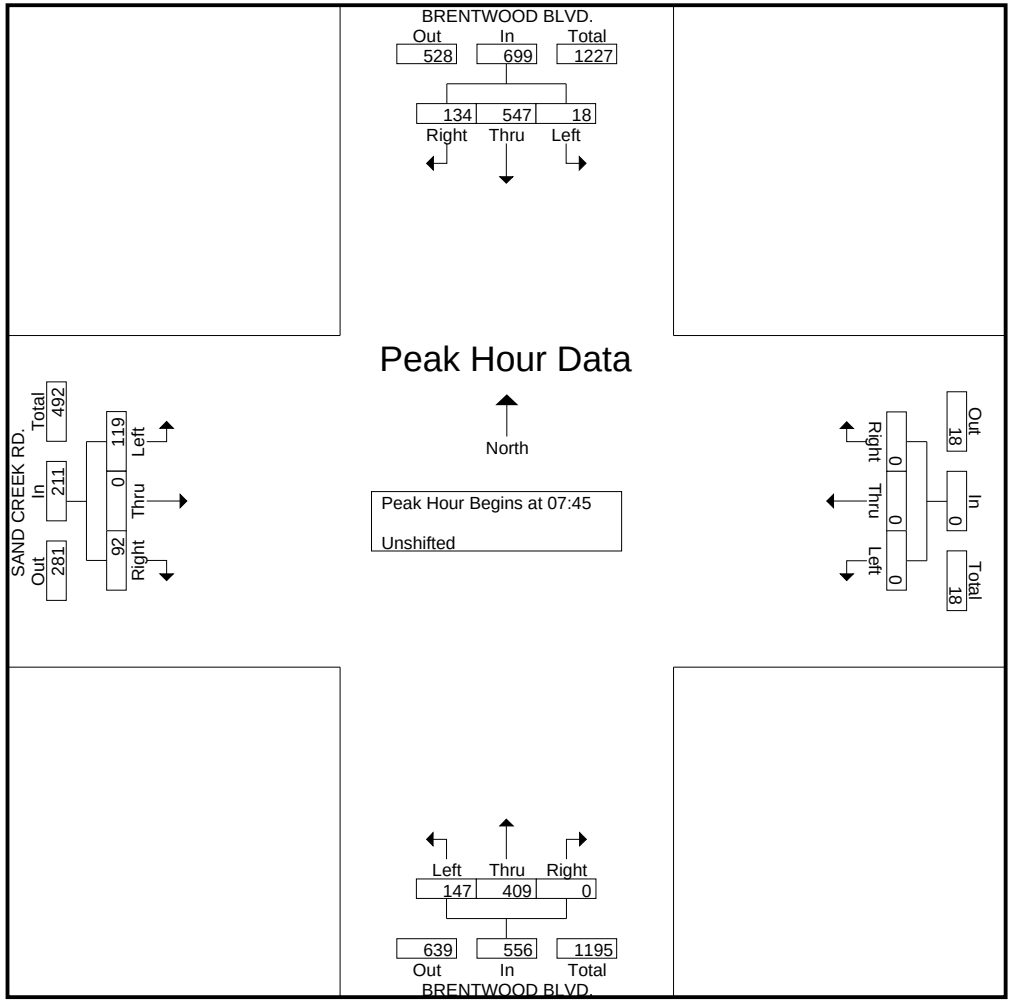
	BRENTWOOD BLVD. Southbound				Westbound				BRENTWOOD BLVD. Northbound				SAND CREEK RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	3	144	32	179	0	0	0	0	**43**	101	0	144	23	0	24	47	370
08:00	2	**145**	**44**	**191**	0	0	0	0	41	**129**	0	**170**	37	0	**27**	**64**	**425**
08:15	4	137	29	170	0	0	0	0	37	81	0	118	**38**	0	23	61	349
08:30	**9**	121	29	159	0	0	0	0	26	98	0	124	21	0	18	39	322
Total Volume	18	547	134	699	0	0	0	0	147	409	0	556	119	0	92	211	1466
% App. Total	2.6	78.3	19.2		0	0	0		26.4	73.6	0		56.4	0	43.6		
PHF	.500	.943	.761	.915	.000	.000	.000	.000	.855	.793	.000	.818	.783	.000	.852	.824	.862

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-009 BRENTWOOD-SAND CREEK-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

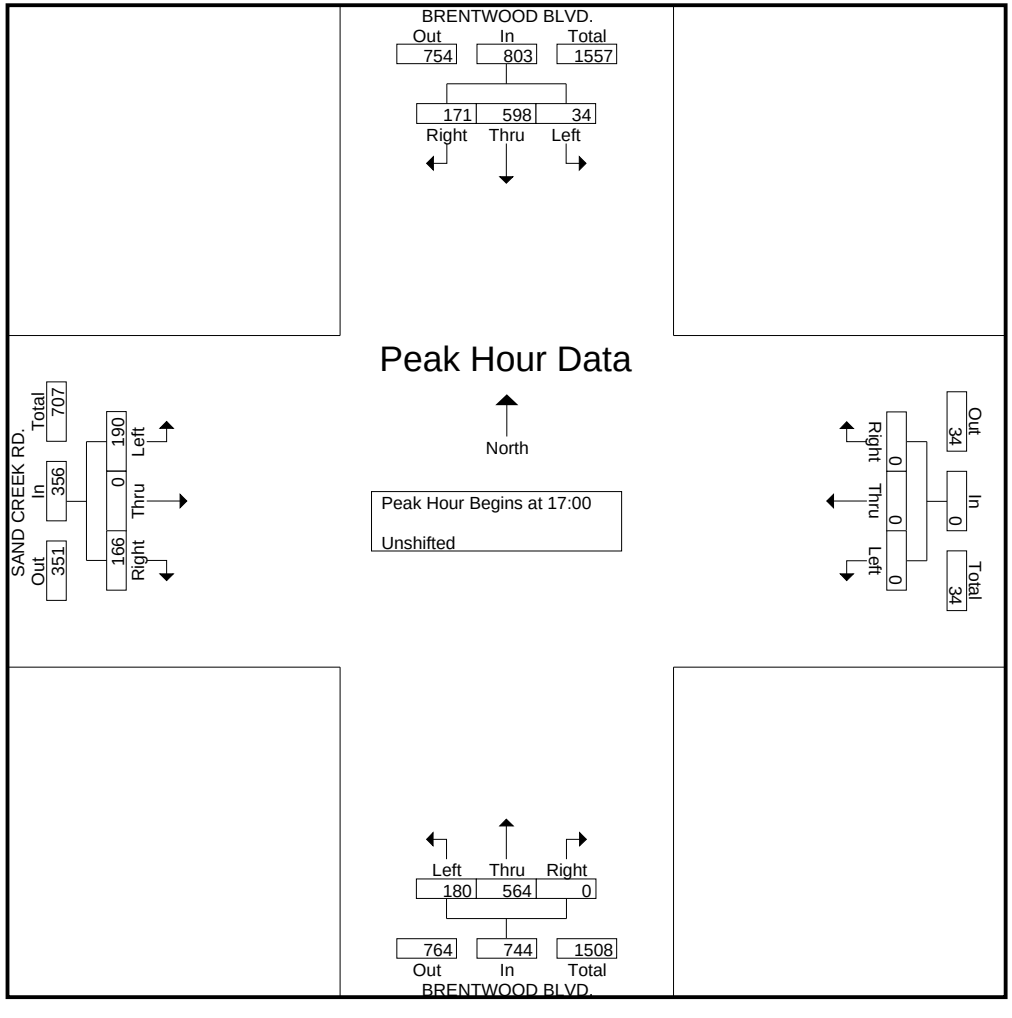
17:00	8	140	36	184	0	0	0	0	**49**	133	0	182	49	0	47	96	462
17:15	**11**	163	39	213	0	0	0	0	44	136	0	180	48	0	27	75	468
17:30	7	**165**	44	**216**	0	0	0	0	46	135	0	181	34	0	**50**	84	481
17:45	8	130	**52**	190	0	0	0	0	41	**160**	0	**201**	**59**	0	42	**101**	**492**
Total Volume	34	598	171	803	0	0	0	0	180	564	0	744	190	0	166	356	1903
% App. Total	4.2	74.5	21.3		0	0	0		24.2	75.8	0		53.4	0	46.6		
PHF	.773	.906	.822	.929	.000	.000	.000	.000	.918	.881	.000	.925	.805	.000	.830	.881	.967

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-009 BRENTWOOD-SAND CREEK-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

SACRAMENTO

File Name : 08-7637-010 BRENTWOOD-TECHOLOGY-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound					Westbound					BRENTWOOD BLVD. Northbound					TECHNOLOGY WAY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	0	88	2	0	90	0	0	0	0	0	0	86	0	0	86	1	0	2	0	3	179
07:15	0	86	2	0	88	0	0	0	0	0	7	91	0	0	98	2	0	7	0	9	195
07:30	0	122	6	0	128	0	0	0	0	0	7	91	0	0	98	3	0	8	0	11	237
07:45	0	151	5	0	156	0	0	0	0	0	7	145	0	0	152	3	0	6	0	9	317
Total	0	447	15	0	462	0	0	0	0	0	21	413	0	0	434	9	0	23	0	32	928
08:00	0	178	2	0	180	0	0	0	0	0	9	187	0	0	196	4	0	7	0	11	387
08:15	0	158	4	0	162	0	0	0	0	0	5	108	0	0	113	4	0	10	0	14	289
08:30	0	142	3	0	145	0	0	0	0	0	4	119	0	0	123	3	0	3	0	6	274
08:45	0	143	3	0	146	0	0	0	0	0	3	124	0	0	127	1	0	4	0	5	278
Total	0	621	12	0	633	0	0	0	0	0	21	538	0	0	559	12	0	24	0	36	1228
*** BREAK ***																					
16:00	0	178	4	0	182	0	0	0	0	0	9	180	0	0	189	5	0	5	0	10	381
16:15	0	179	2	0	181	0	0	0	0	0	2	179	0	0	181	6	0	2	0	8	370
16:30	0	158	5	0	163	0	0	0	0	0	8	166	0	0	174	3	0	8	0	11	348
16:45	0	166	8	0	174	0	0	0	0	0	4	172	0	0	176	2	0	7	0	9	359
Total	0	681	19	0	700	0	0	0	0	0	23	697	0	0	720	16	0	22	0	38	1458
17:00	0	189	3	0	192	0	0	0	0	0	9	174	0	0	183	3	0	7	0	10	385
17:15	0	192	4	0	196	0	0	0	0	0	8	170	0	0	178	3	0	4	0	7	381
17:30	0	215	2	0	217	0	0	0	0	0	10	182	0	0	192	3	0	7	0	10	419
17:45	0	167	6	0	173	0	0	0	0	0	9	195	0	0	204	5	0	7	0	12	389
Total	0	763	15	0	778	0	0	0	0	0	36	721	0	0	757	14	0	25	0	39	1574
Grand Total	0	2512	61	0	2573	0	0	0	0	0	101	2369	0	0	2470	51	0	94	0	145	5188
Apprch %	0	97.6	2.4	0		0	0	0	0		4.1	95.9	0	0		35.2	0	64.8	0		
Total %	0	48.4	1.2	0	49.6	0	0	0	0	0	1.9	45.7	0	0	47.6	1	0	1.8	0	2.8	

	BRENTWOOD BLVD. Southbound					Westbound					BRENTWOOD BLVD. Northbound					TECHNOLOGY WAY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45																					
07:45	0	151	**5**	0	156	0	0	0	0	0	7	145	0	0	152	3	0	6	0	9	317
08:00	0	**178**	2	0	**180**	0	0	0	0	0	**9**	**187**	0	0	**196**	**4**	0	7	0	11	**387**
08:15	0	158	4	0	162	0	0	0	0	0	5	108	0	0	113	4	0	**10**	0	**14**	289
08:30	0	142	3	0	145	0	0	0	0	0	4	119	0	0	123	3	0	3	0	6	274
Total Volume	0	629	14	0	643	0	0	0	0	0	25	559	0	0	584	14	0	26	0	40	1267
% App. Total	0	97.8	2.2	0		0	0	0	0		4.3	95.7	0	0		35	0	65	0		
PHF	.000	.883	.700	.000	.893	.000	.000	.000	.000	.000	.694	.747	.000	.000	.745	.875	.000	.650	.000	.714	.818

All Traffic Data

(916) 771-8700
F (916) 786-2879

SACRAMENTO

File Name : 08-7637-010 BRENTWOOD-TECHOLOGY-F
Site Code : 00000000
Start Date : 10/28/2008
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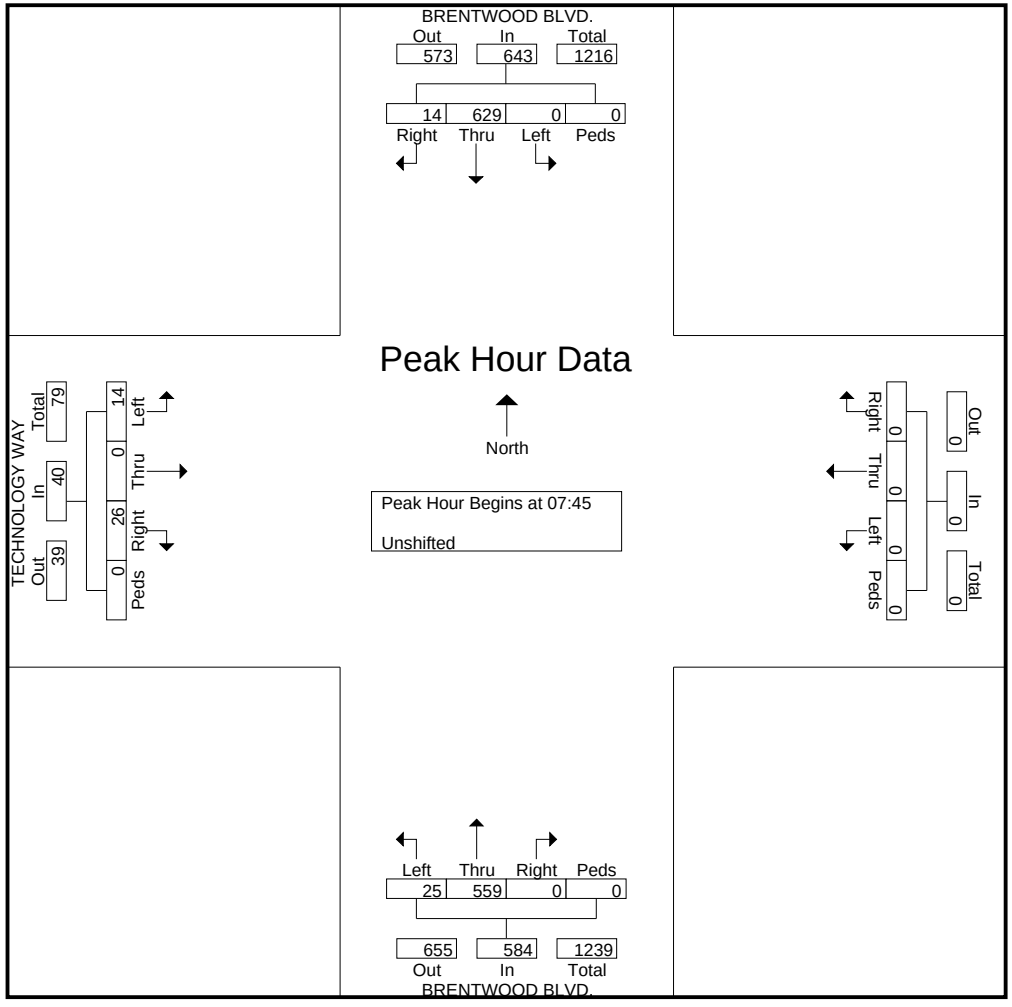


Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

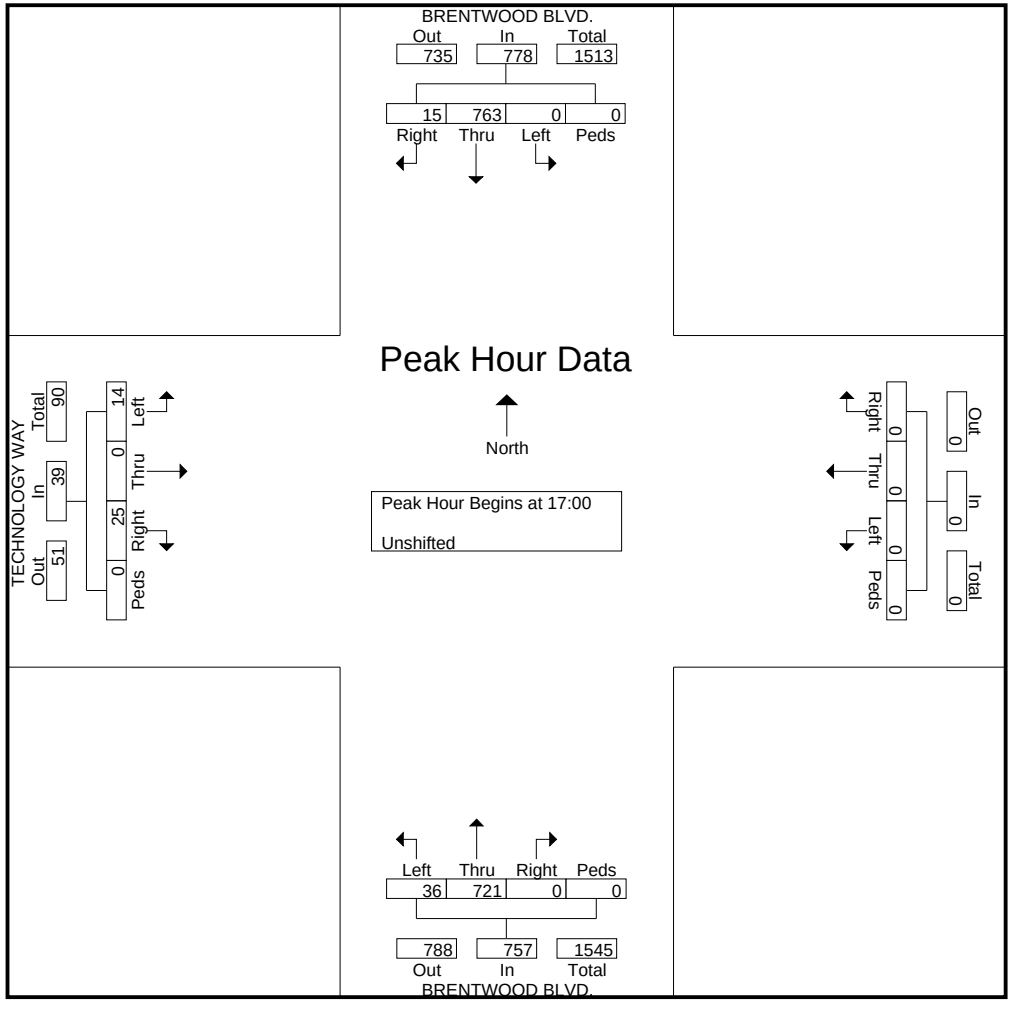
17:00	0	189	3	0	192	0	0	0	0	0	9	174	0	0	183	3	0	**7**	0	10	385
17:15	0	192	4	0	196	0	0	0	0	0	8	170	0	0	178	3	0	4	0	7	381
17:30	0	**215**	2	0	**217**	0	0	0	0	0	**10**	182	0	0	192	3	0	7	0	10	**419**
17:45	0	167	**6**	0	173	0	0	0	0	0	9	**195**	0	0	**204**	**5**	0	7	0	**12**	389
Total Volume	0	763	15	0	778	0	0	0	0	0	36	721	0	0	757	14	0	25	0	39	1574
% App. Total	0	98.1	1.9	0		0	0	0	0		4.8	95.2	0	0		35.9	0	64.1	0		
PHF	.000	.887	.625	.000	.896	.000	.000	.000	.000	.000	.900	.924	.000	.000	.928	.700	.000	.893	.000	.813	.939

All Traffic Data

(916) 771-8700
F (916) 786-2879

SACRAMENTO

File Name : 08-7637-010 BRENTWOOD-TECHOLOGY-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-011 BRENTWOOD-VILLAGE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				VILLAGE DR. Westbound				BRENTWOOD BLVD. Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	3	82	0	85	3	0	12	15	0	71	7	78	0	0	0	0	178
07:15	6	93	0	99	3	0	6	9	0	88	2	90	0	0	0	0	198
07:30	3	123	0	126	9	0	9	18	0	81	7	88	0	0	0	0	232
07:45	7	159	0	166	7	0	14	21	0	144	3	147	0	0	0	0	334
Total	19	457	0	476	22	0	41	63	0	384	19	403	0	0	0	0	942
08:00	5	166	0	171	7	0	7	14	0	178	19	197	0	0	0	0	382
08:15	3	160	0	163	2	0	4	6	0	108	7	115	0	0	0	0	284
08:30	7	140	0	147	3	0	2	5	0	114	8	122	0	0	0	0	274
08:45	5	143	0	148	2	0	4	6	0	123	4	127	0	0	0	0	281
Total	20	609	0	629	14	0	17	31	0	523	38	561	0	0	0	0	1221
*** BREAK ***																	
16:00	10	163	0	173	8	0	9	17	0	169	16	185	0	0	0	0	375
16:15	8	166	0	174	3	0	11	14	0	164	15	179	0	0	0	0	367
16:30	13	146	0	159	4	0	1	5	0	168	9	177	0	0	0	0	341
16:45	15	154	0	169	3	0	5	8	0	163	17	180	0	0	0	0	357
Total	46	629	0	675	18	0	26	44	0	664	57	721	0	0	0	0	1440
17:00	15	175	0	190	7	0	10	17	0	175	13	188	0	0	0	0	395
17:15	14	164	0	178	5	0	12	17	0	163	5	168	0	0	0	0	363
17:30	15	193	0	208	7	0	13	20	0	179	13	192	0	0	0	0	420
17:45	14	166	0	180	9	0	11	20	0	171	19	190	0	0	0	0	390
Total	58	698	0	756	28	0	46	74	0	688	50	738	0	0	0	0	1568
Grand Total	143	2393	0	2536	82	0	130	212	0	2259	164	2423	0	0	0	0	5171
Apprch %	5.6	94.4	0		38.7	0	61.3		0	93.2	6.8		0	0	0		
Total %	2.8	46.3	0	49	1.6	0	2.5	4.1	0	43.7	3.2	46.9	0	0	0	0	

	BRENTWOOD BLVD. Southbound				VILLAGE DR. Westbound				BRENTWOOD BLVD. Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	**7**	159	0	166	**7**	0	**14**	**21**	0	144	3	147	0	0	0	0	334
08:00	5	**166**	0	**171**	7	0	7	14	0	**178**	**19**	**197**	0	0	0	0	**382**
08:15	3	160	0	163	2	0	4	6	0	108	7	115	0	0	0	0	284
08:30	7	140	0	147	3	0	2	5	0	114	8	122	0	0	0	0	274
Total Volume	22	625	0	647	19	0	27	46	0	544	37	581	0	0	0	0	1274
% App. Total	3.4	96.6	0		41.3	0	58.7		0	93.6	6.4		0	0	0		
PHF	.786	.941	.000	.946	.679	.000	.482	.548	.000	.764	.487	.737	.000	.000	.000	.000	.834

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-011 BRENTWOOD-VILLAGE-F
Site Code : 00000000
Start Date : 10/28/2008
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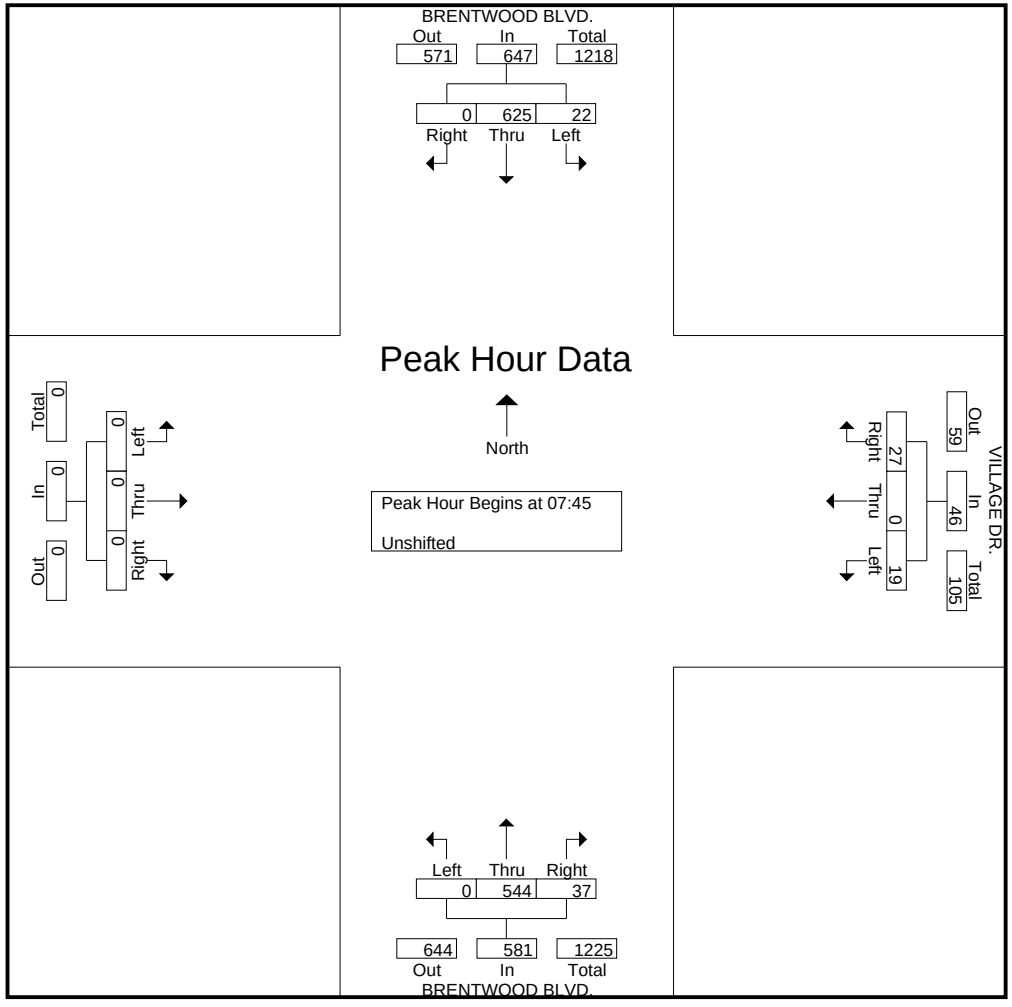


Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

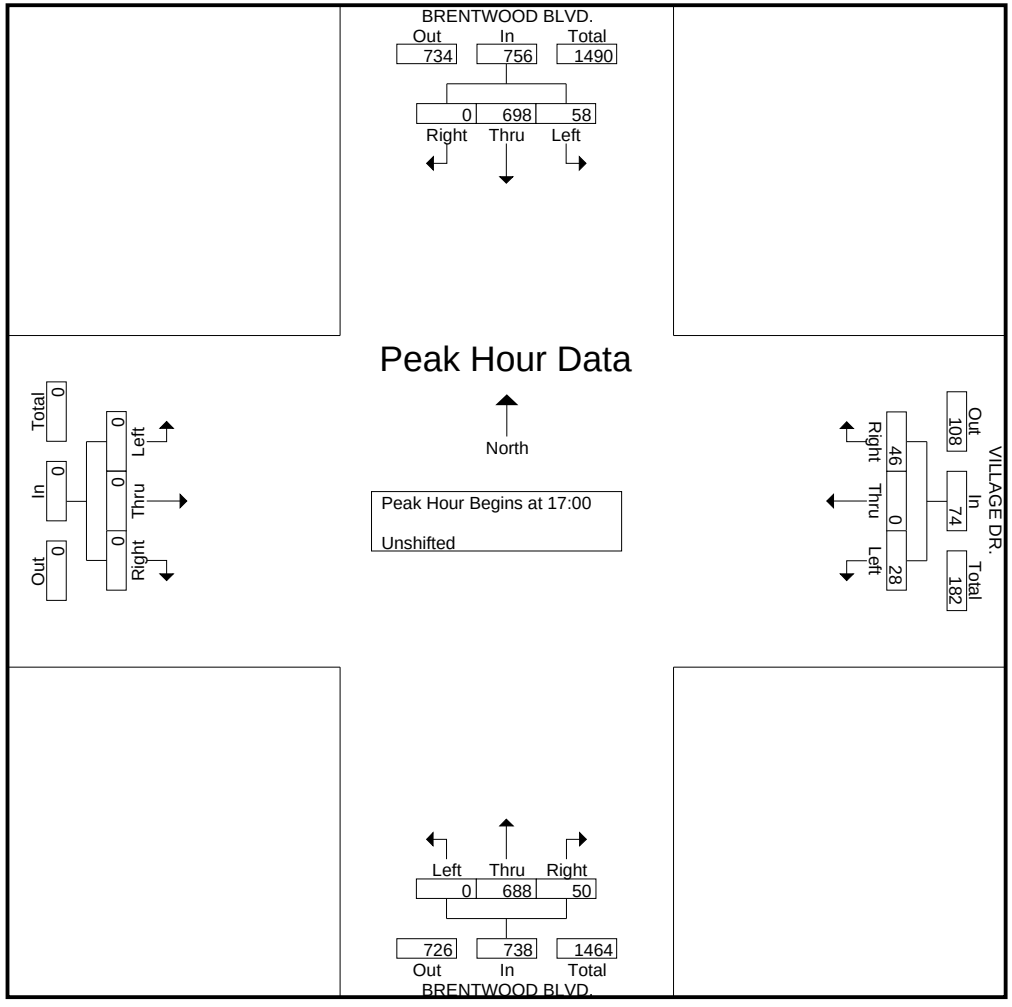
17:00	**15**	175	0	190	7	0	10	17	0	175	13	188	0	0	0	0	395
17:15	14	164	0	178	5	0	12	17	0	163	5	168	0	0	0	0	363
17:30	15	**193**	0	**208**	7	0	**13**	**20**	0	**179**	13	**192**	0	0	0	0	**420**
17:45	14	166	0	180	**9**	0	11	20	0	171	**19**	190	0	0	0	0	390
Total Volume	58	698	0	756	28	0	46	74	0	688	50	738	0	0	0	0	1568
% App. Total	7.7	92.3	0		37.8	0	62.2		0	93.2	6.8		0	0	0		
PHF	.967	.904	.000	.909	.778	.000	.885	.925	.000	.961	.658	.961	.000	.000	.000	.000	.933

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-011 BRENTWOOD-VILLAGE-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-012 BRENTWOOD-CENTRAL-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	BRENTWOOD BLVD. Southbound				SYCAMORE AVE. Westbound				BRENTWOOD BLVD. Northbound				CENTRAL BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	5	73	5	83	4	7	19	30	0	50	1	51	4	4	2	10	174
07:15	9	70	12	91	5	20	24	49	1	60	0	61	8	7	6	21	222
07:30	12	108	22	142	11	18	20	49	3	65	5	73	10	8	4	22	286
07:45	18	120	26	164	18	40	35	93	12	99	12	123	16	13	8	37	417
Total	44	371	65	480	38	85	98	221	16	274	18	308	38	32	20	90	1099
08:00	16	132	17	165	12	20	38	70	17	126	15	158	33	19	8	60	453
08:15	17	112	26	155	5	14	31	50	3	70	8	81	10	14	7	31	317
08:30	14	117	16	147	5	10	20	35	1	82	4	87	19	9	8	36	305
08:45	13	113	16	142	5	10	21	36	5	90	3	98	18	11	9	38	314
Total	60	474	75	609	27	54	110	191	26	368	30	424	80	53	32	165	1389
*** BREAK ***																	
16:00	24	127	20	171	4	18	30	52	7	129	10	146	25	17	5	47	416
16:15	24	119	21	164	6	12	22	40	7	122	12	141	29	10	9	48	393
16:30	25	106	24	155	7	13	29	49	11	119	12	142	30	25	7	62	408
16:45	27	110	20	157	4	32	29	65	10	124	6	140	27	25	10	62	424
Total	100	462	85	647	21	75	110	206	35	494	40	569	111	77	31	219	1641
17:00	29	126	22	177	8	14	36	58	6	126	4	136	21	22	8	51	422
17:15	30	126	23	179	9	17	24	50	13	114	13	140	26	21	10	57	426
17:30	33	138	24	195	6	10	23	39	7	132	7	146	32	16	8	56	436
17:45	22	130	26	178	10	18	26	54	8	135	14	157	25	18	8	51	440
Total	114	520	95	729	33	59	109	201	34	507	38	579	104	77	34	215	1724
Grand Total	318	1827	320	2465	119	273	427	819	111	1643	126	1880	333	239	117	689	5853
Apprch %	12.9	74.1	13		14.5	33.3	52.1		5.9	87.4	6.7		48.3	34.7	17		
Total %	5.4	31.2	5.5	42.1	2	4.7	7.3	14	1.9	28.1	2.2	32.1	5.7	4.1	2	11.8	

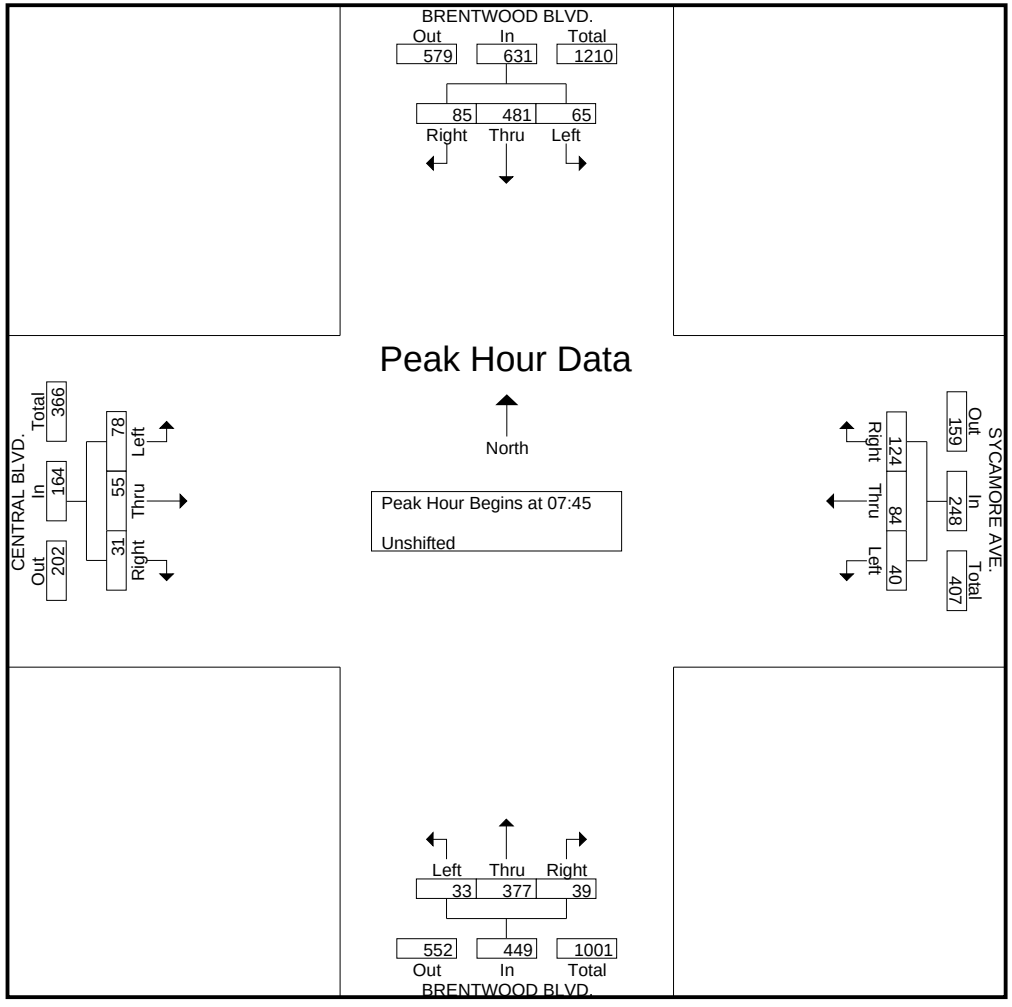
	BRENTWOOD BLVD. Southbound				SYCAMORE AVE. Westbound				BRENTWOOD BLVD. Northbound				CENTRAL BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	**18**	120	**26**	164	**18**	**40**	35	**93**	12	99	12	123	16	13	**8**	37	417
08:00	16	**132**	17	**165**	12	20	**38**	70	**17**	**126**	**15**	**158**	**33**	**19**	8	**60**	**453**
08:15	17	112	26	155	5	14	31	50	3	70	8	81	10	14	7	31	317
08:30	14	117	16	147	5	10	20	35	1	82	4	87	19	9	8	36	305
Total Volume	65	481	85	631	40	84	124	248	33	377	39	449	78	55	31	164	1492
% App. Total	10.3	76.2	13.5		16.1	33.9	50		7.3	84	8.7		47.6	33.5	18.9		
PHF	.903	.911	.817	.956	.556	.525	.816	.667	.485	.748	.650	.710	.591	.724	.969	.683	.823

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-012 BRENTWOOD-CENTRAL-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

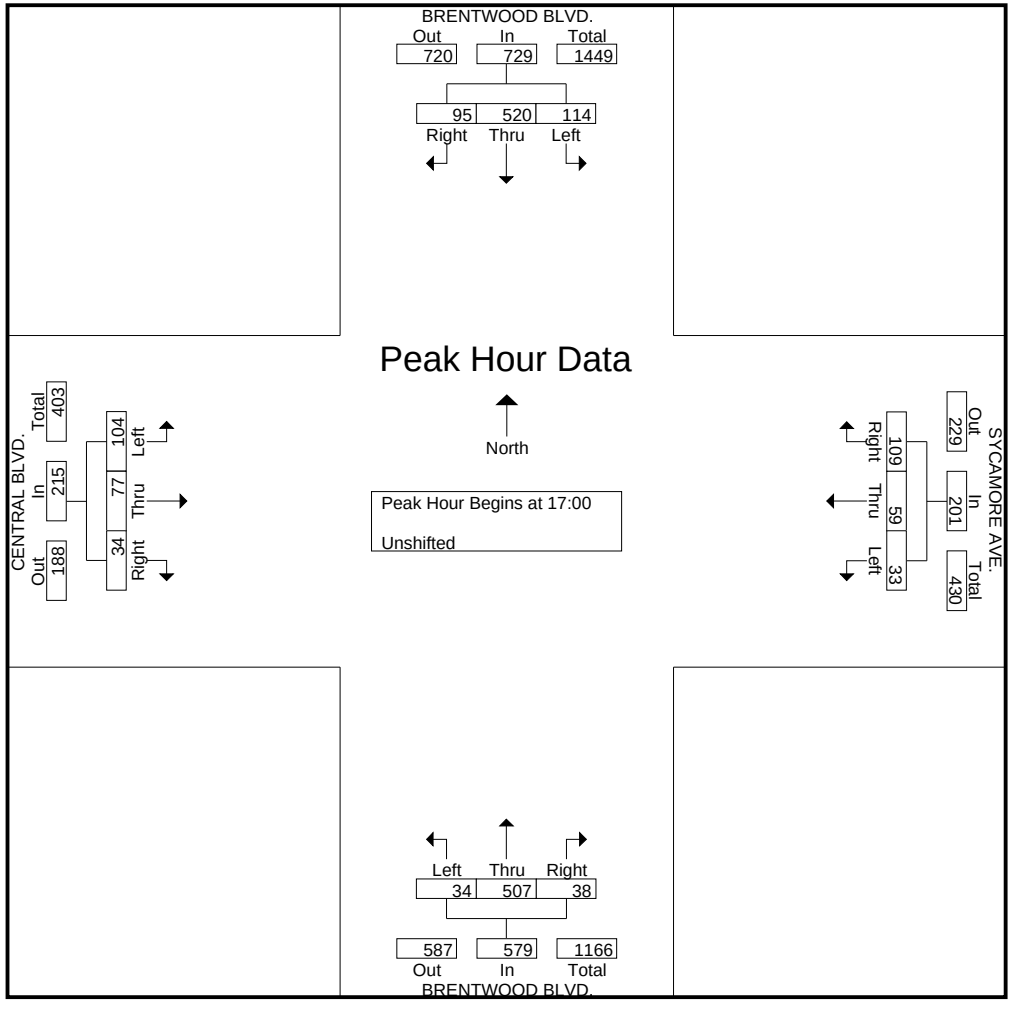
17:00	29	126	22	177	8	14	**36**	**58**	6	126	4	136	21	**22**	8	51	422
17:15	30	126	23	179	9	17	24	50	**13**	114	13	140	26	21	**10**	**57**	426
17:30	**33**	**138**	24	**195**	6	10	23	39	7	132	7	146	**32**	16	8	56	436
17:45	22	130	**26**	178	**10**	**18**	26	54	8	**135**	**14**	**157**	25	18	8	51	**440**
Total Volume	114	520	95	729	33	59	109	201	34	507	38	579	104	77	34	215	1724
% App. Total	15.6	71.3	13		16.4	29.4	54.2		5.9	87.6	6.6		48.4	35.8	15.8		
PHF	.864	.942	.913	.935	.825	.819	.757	.866	.654	.939	.679	.922	.813	.875	.850	.943	.980

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-012 BRENTWOOD-CENTRAL-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-013 O'HARA-SAND CREEK-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 1

Groups Printed- Unshifted

	O'HARA AVE. Southbound				BRENTWOOD BLVD. Westbound				O'HARA AVE. Northbound				BRENTWOOD BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	3	30	8	41	2	37	4	43	17	13	4	34	10	19	16	45	163
07:15	8	47	21	76	9	36	6	51	22	27	7	56	13	21	24	58	241
07:30	5	61	18	84	4	33	9	46	21	32	6	59	24	35	57	116	305
07:45	16	95	12	123	11	59	9	79	21	76	8	105	43	54	99	196	503
Total	32	233	59	324	26	165	28	219	81	148	25	254	90	129	196	415	1212
08:00	15	83	58	156	10	57	12	79	50	65	7	122	48	66	67	181	538
08:15	12	82	36	130	7	49	3	59	21	35	10	66	48	68	66	182	437
08:30	7	52	9	68	9	41	2	52	21	28	7	56	16	44	48	108	284
08:45	11	46	16	73	9	53	7	69	42	24	8	74	13	56	44	113	329
Total	45	263	119	427	35	200	24	259	134	152	32	318	125	234	225	584	1588
*** BREAK ***																	
16:00	18	50	14	82	10	75	6	91	51	64	16	131	23	68	45	136	440
16:15	16	77	8	101	10	73	3	86	35	87	8	130	16	71	27	114	431
16:30	16	51	12	79	17	78	10	105	44	81	12	137	23	81	29	133	454
16:45	18	47	22	87	15	79	21	115	73	63	8	144	16	82	28	126	472
Total	68	225	56	349	52	305	40	397	203	295	44	542	78	302	129	509	1797
17:00	14	52	22	88	14	81	17	112	89	99	11	199	27	70	41	138	537
17:15	13	61	39	113	17	81	16	114	51	73	9	133	26	66	44	136	496
17:30	13	86	38	137	13	89	10	112	58	82	8	148	22	65	23	110	507
17:45	21	87	22	130	14	89	17	120	84	86	6	176	24	89	30	143	569
Total	61	286	121	468	58	340	60	458	282	340	34	656	99	290	138	527	2109
Grand Total	206	1007	355	1568	171	1010	152	1333	700	935	135	1770	392	955	688	2035	6706
Apprch %	13.1	64.2	22.6		12.8	75.8	11.4		39.5	52.8	7.6		19.3	46.9	33.8		
Total %	3.1	15	5.3	23.4	2.5	15.1	2.3	19.9	10.4	13.9	2	26.4	5.8	14.2	10.3	30.3	

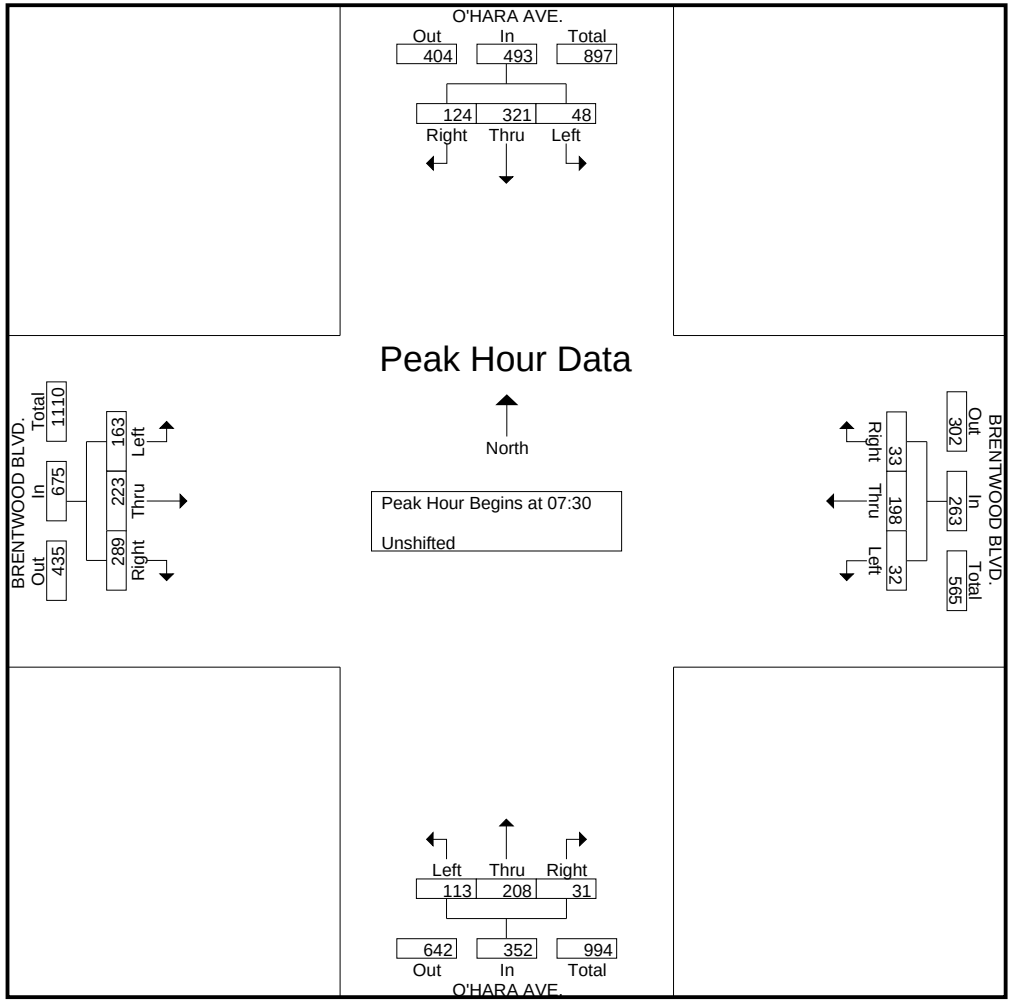
	O'HARA AVE. Southbound				BRENTWOOD BLVD. Westbound				O'HARA AVE. Northbound				BRENTWOOD BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	5	61	18	84	4	33	9	46	21	32	6	59	24	35	57	116	305
07:45	**16**	**95**	12	123	**11**	**59**	9	**79**	21	**76**	8	105	43	54	**99**	**196**	503
08:00	15	83	**58**	**156**	10	57	**12**	79	**50**	65	7	**122**	**48**	66	67	181	**538**
08:15	12	82	36	130	7	49	3	59	21	35	**10**	66	48	**68**	66	182	437
Total Volume	48	321	124	493	32	198	33	263	113	208	31	352	163	223	289	675	1783
% App. Total	9.7	65.1	25.2		12.2	75.3	12.5		32.1	59.1	8.8		24.1	33	42.8		
PHF	.750	.845	.534	.790	.727	.839	.688	.832	.565	.684	.775	.721	.849	.820	.730	.861	.829

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-013 O'HARA-SAND CREEK-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 2



Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

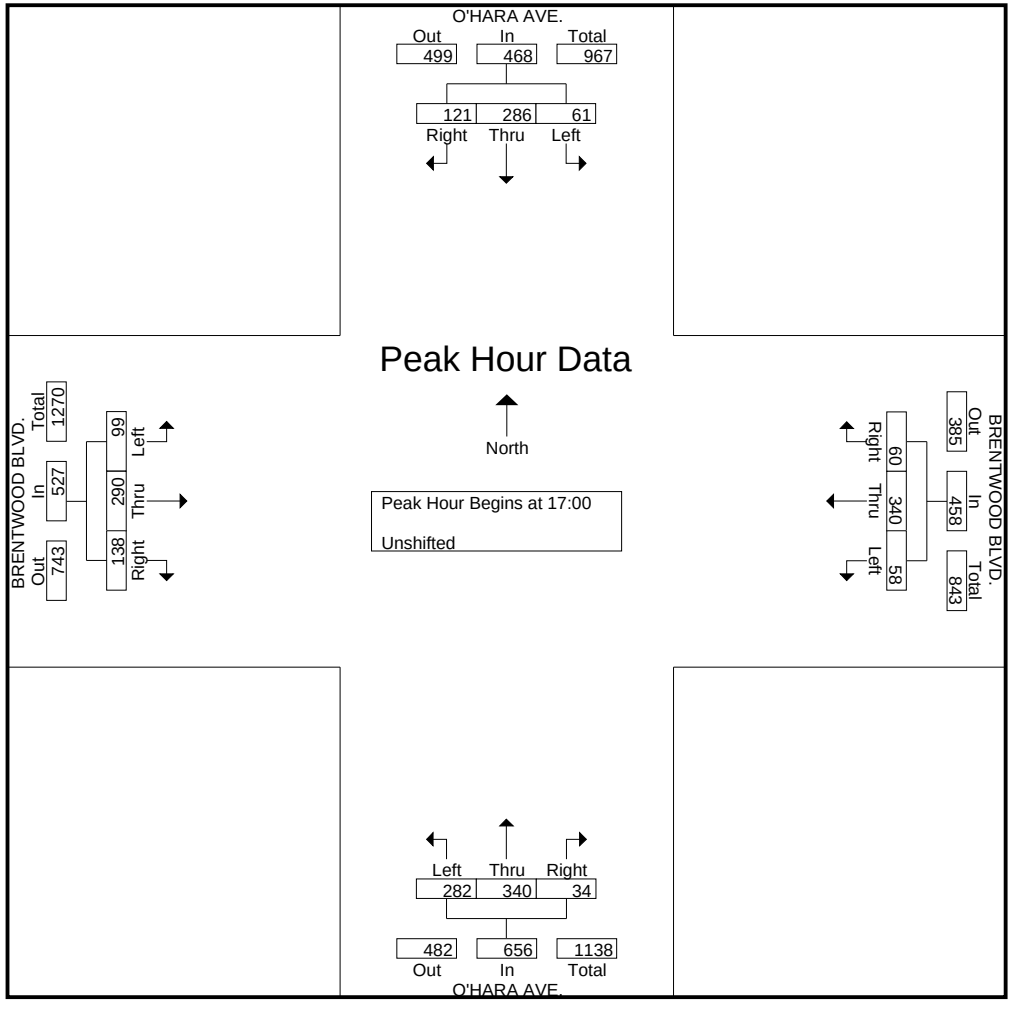
17:00	14	52	22	88	14	81	**17**	112	**89**	**99**	**11**	**199**	**27**	70	41	138	537
17:15	13	61	**39**	113	**17**	81	16	114	51	73	9	133	26	66	**44**	136	496
17:30	13	86	38	**137**	13	**89**	10	112	58	82	8	148	22	65	23	110	507
17:45	**21**	**87**	22	130	14	89	17	**120**	84	86	6	176	24	**89**	30	**143**	**569**
Total Volume	61	286	121	468	58	340	60	458	282	340	34	656	99	290	138	527	2109
% App. Total	13	61.1	25.9		12.7	74.2	13.1		43	51.8	5.2		18.8	55	26.2		
PHF	.726	.822	.776	.854	.853	.955	.882	.954	.792	.859	.773	.824	.917	.815	.784	.921	.927

All Traffic Data

(916) 771-8700
F (916) 786-2879

BRENTWOOD

File Name : 08-7637-013 O'HARA-SAND CREEK-F
Site Code : 00000000
Start Date : 10/28/2008
Page No : 3



Prepared by NDS/ATD

Volumes for: Wednesday, October 29, 2008 **City:** Brentwood **Project #:** 08-7638-001

Location: Lone Tree Way W/o Brentwood Blvd

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			15		7			12:00			80		83		
00:15			15		9			12:15			93		91		
00:30			5		8			12:30			108		73		
00:45			12	47	5	29	76	12:45			84	365	90	337	702
01:00			9		15			13:00			102		76		
01:15			10		7			13:15			113		64		
01:30			3		10			13:30			83		92		
01:45			10	32	11	43	75	13:45			91	389	92	324	713
02:00			6		7			14:00			107		106		
02:15			6		8			14:15			115		103		
02:30			3		6			14:30			101		82		
02:45			1	16	7	28	44	14:45			85	408	82	373	781
03:00			3		5			15:00			89		80		
03:15			5		12			15:15			107		70		
03:30			5		8			15:30			100		90		
03:45			10	23	3	28	51	15:45			99	395	84	324	719
04:00			6		12			16:00			109		92		
04:15			12		9			16:15			90		99		
04:30			10		25			16:30			111		65		
04:45			12	40	20	66	106	16:45			104	414	73	329	743
05:00			30		33			17:00			95		84		
05:15			17		32			17:15			91		96		
05:30			17		26			17:30			83		95		
05:45			20	84	29	120	204	17:45			110	379	80	355	734
06:00			31		42			18:00			92		76		
06:15			30		41			18:15			88		95		
06:30			35		29			18:30			97		83		
06:45			29	125	62	174	299	18:45			106	383	79	333	716
07:00			35		57			19:00			101		78		
07:15			52		74			19:15			83		76		
07:30			45		77			19:30			79		57		
07:45			54	186	80	288	474	19:45			78	341	65	276	617
08:00			64		91			20:00			65		47		
08:15			71		98			20:15			62		52		
08:30			89		87			20:30			53		54		
08:45			61	285	80	356	641	20:45			60	240	26	179	419
09:00			79		86			21:00			59		54		
09:15			56		77			21:15			69		44		
09:30			56		76			21:30			44		17		
09:45			51	242	73	312	554	21:45			30	202	29	144	346
10:00			62		61			22:00			26		18		
10:15			60		64			22:15			30		20		
10:30			68		73			22:30			21		22		
10:45			78	268	84	282	550	22:45			23	100	24	84	184
11:00			70		78			23:00			26		23		
11:15			91		69			23:15			18		8		
11:30			83		89			23:30			18		10		
11:45			97	341	103	339	680	23:45			25	87	6	47	134
Total Vol.				1689		2065	**3754**					3703		3105	**6808**

Daily Totals

	NB	SB		EB	WB
			Combined	5392	5170
			10562		

	AM			PM		
Split %	45.0%	55.0%	**35.5%**	54.4%	45.6%	**64.5%**
Peak Hour	11:45	11:30	**11:45**	15:15	13:30	**13:45**

Prepared by NDS/ATD

Volumes for: Wednesday, October 29, 2008 **City:** Brentwood **Project #:** 08-7638-002

Location: Brentwood Blvd N/o Sand Creek Rd

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	23		16					12:00	191		146				
00:15	14		11					12:15	156		175				
00:30	14		7					12:30	156		193				
00:45	9	60	12	46			106	12:45	173	676	176	690			1366
01:00	15		8					13:00	173		194				
01:15	12		9					13:15	184		204				
01:30	18		6					13:30	203		143				
01:45	14	59	1	24			83	13:45	152	712	186	727			1439
02:00	15		11					14:00	211		181				
02:15	8		9					14:15	168		167				
02:30	11		5					14:30	166		158				
02:45	8	42	3	28			70	14:45	149	694	163	669			1363
03:00	5		4					15:00	163		151				
03:15	7		9					15:15	168		141				
03:30	7		7					15:30	183		147				
03:45	5	24	16	36			60	15:45	174	688	173	612			1300
04:00	11		10					16:00	168		184				
04:15	17		30					16:15	162		146				
04:30	19		23					16:30	190		144				
04:45	26	73	42	105			178	16:45	177	697	193	667			1364
05:00	36		45					17:00	184		169				
05:15	27		62					17:15	199		139				
05:30	30		59					17:30	149		157				
05:45	34	127	79	245			372	17:45	174	706	158	623			1329
06:00	41		70					18:00	194		168				
06:15	48		74					18:15	179		199				
06:30	65		78					18:30	171		146				
06:45	92	246	80	302			548	18:45	163	707	142	655			1362
07:00	103		94					19:00	160		158				
07:15	80		110					19:15	147		139				
07:30	102		91					19:30	131		127				
07:45	115	400	151	446			846	19:45	137	575	140	564			1139
08:00	133		183					20:00	93		114				
08:15	172		176					20:15	111		96				
08:30	136		155					20:30	118		90				
08:45	126	567	160	674			1241	20:45	89	411	62	362			773
09:00	140		159					21:00	114		59				
09:15	103		124					21:15	98		85				
09:30	119		137					21:30	70		57				
09:45	123	485	120	540			1025	21:45	66	348	41	242			590
10:00	142		153					22:00	49		50				
10:15	116		111					22:15	52		40				
10:30	146		120					22:30	38		35				
10:45	147	551	138	522			1073	22:45	27	166	26	151			317
11:00	147		152					23:00	42		22				
11:15	144		131					23:15	24		12				
11:30	150		143					23:30	10		23				
11:45	147	588	154	580			1168	23:45	16	92	17	74			166
Total Vol.		3222		3548			**6770**			6472		6036			**12508**

Daily Totals

NB	SB	Combined	EB	WB
9694	9584	**19278**		

	AM			PM		
Split %	47.6%	52.4%	**35.1%**	51.7%	48.3%	**64.9%**
Peak Hour	11:45	08:00	**11:45**	13:15	12:30	**13:15**

Prepared by NDS/ATD

Volumes for: Wednesday, October 29, 2008 **City:** Brentwood **Project #:** 08-7638-003

Location: Brentwood Blvd S/o Sand Creek Rd

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	18		18					12:00	190		176				
00:15	15		21					12:15	180		186				
00:30	14		6					12:30	171		205				
00:45	8	55	15	60			115	12:45	189	730	174	741			1471
01:00	15		9					13:00	184		196				
01:15	12		10					13:15	194		207				
01:30	19		10					13:30	181		170				
01:45	19	65	4	33			98	13:45	171	730	195	768			1498
02:00	12		11					14:00	212		212				
02:15	9		10					14:15	188		196				
02:30	10		5					14:30	185		186				
02:45	9	40	4	30			70	14:45	162	747	185	779			1526
03:00	6		2					15:00	180		147				
03:15	8		9					15:15	149		179				
03:30	8		6					15:30	183		173				
03:45	6	28	15	32			60	15:45	167	679	185	684			1363
04:00	15		11					16:00	180		192				
04:15	17		31					16:15	184		176				
04:30	27		20					16:30	157		155				
04:45	25	84	43	105			189	16:45	168	689	195	718			1407
05:00	40		42					17:00	188		183				
05:15	36		54					17:15	192		163				
05:30	33		60					17:30	151		172				
05:45	51	160	78	234			394	17:45	174	705	165	683			1388
06:00	50		61					18:00	170		161				
06:15	52		71					18:15	156		193				
06:30	77		81					18:30	172		170				
06:45	92	271	81	294			565	18:45	148	646	144	668			1314
07:00	98		87					19:00	148		156				
07:15	85		84					19:15	135		142				
07:30	115		100					19:30	127		130				
07:45	119	417	138	409			826	19:45	116	526	137	565			1091
08:00	149		169					20:00	96		122				
08:15	181		172					20:15	110		112				
08:30	147		154					20:30	121		96				
08:45	141	618	160	655			1273	20:45	87	414	73	403			817
09:00	160		151					21:00	107		76				
09:15	125		115					21:15	78		83				
09:30	128		129					21:30	55		71				
09:45	124	537	123	518			1055	21:45	55	295	62	292			587
10:00	134		166					22:00	48		67				
10:15	128		134					22:15	53		45				
10:30	140		110					22:30	33		42				
10:45	148	550	135	545			1095	22:45	25	159	34	188			347
11:00	147		181					23:00	38		32				
11:15	150		145					23:15	19		20				
11:30	164		144					23:30	12		29				
11:45	162	623	191	661			1284	23:45	16	85	22	103			188
Total Vol.		3448		3576			**7024**			6405		6592			**12997**

Daily Totals

NB	SB	Combined	EB	WB
9853	10168	**20021**		

	AM			PM		
Split %	49.1%	50.9%	**35.1%**	49.3%	50.7%	**64.9%**
Peak Hour	11:45	11:45	**11:45**	13:15	13:45	**13:45**

Prepared by NDS/ATD

Volumes for: Wednesday, October 29, 2008 **City:** Brentwood **Project #:** 08-7638-004

Location: Sand Creek Rd W/o Brentwood Rd

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			12		9			12:00			66		60		
00:15			11		4			12:15			63		66		
00:30			2		3			12:30			62		63		
00:45			6	31	2	18	49	12:45			78	269	82	271	540
01:00			5		7			13:00			60		76		
01:15			0		1			13:15			78		80		
01:30			4		3			13:30			110		61		
01:45			3	12	5	16	28	13:45			81	329	73	290	619
02:00			4		1			14:00			72		79		
02:15			3		2			14:15			69		69		
02:30			3		0			14:30			64		66		
02:45			0	10	1	4	14	14:45			66	271	68	282	553
03:00			0		2			15:00			66		81		
03:15			0		2			15:15			73		43		
03:30			0		2			15:30			73		47		
03:45			1	1	3	9	10	15:45			82	294	46	217	511
04:00			1		3			16:00			71		69		
04:15			3		4			16:15			60		61		
04:30			1		11			16:30			97		48		
04:45			2	7	4	22	29	16:45			76	304	75	253	557
05:00			8		21			17:00			80		71		
05:15			5		17			17:15			81		67		
05:30			5		13			17:30			77		66		
05:45			5	23	21	72	95	17:45			72	310	58	262	572
06:00			7		27			18:00			99		71		
06:15			11		18			18:15			95		83		
06:30			10		19			18:30			86		72		
06:45			20	48	23	87	135	18:45			75	355	64	290	645
07:00			25		29			19:00			80		62		
07:15			19		30			19:15			77		68		
07:30			31		43			19:30			75		56		
07:45			29	104	42	144	248	19:45			61	293	56	242	535
08:00			62		76			20:00			50		56		
08:15			55		74			20:15			54		41		
08:30			78		56			20:30			47		43		
08:45			39	234	48	254	488	20:45			42	193	29	169	362
09:00			61		72			21:00			53		33		
09:15			42		58			21:15			48		46		
09:30			41		45			21:30			46		25		
09:45			51	195	41	216	411	21:45			43	190	20	124	314
10:00			51		43			22:00			22		13		
10:15			47		30			22:15			23		17		
10:30			51		40			22:30			20		11		
10:45			48	197	35	148	345	22:45			16	81	10	51	132
11:00			70		45			23:00			20		9		
11:15			60		45			23:15			8		4		
11:30			63		53			23:30			8		5		
11:45			61	254	44	187	441	23:45			10	46	3	21	67
Total Vol.				1116		1177	**2293**					2935		2472	**5407**

Daily Totals

	NB	SB		EB	WB
			Combined	4051	3649
			7700		

	AM			PM		
Split %	48.7%	51.3%	**29.8%**	54.3%	45.7%	**70.2%**
Peak Hour	11:00	08:00	**08:00**	18:00	12:30	**18:00**

Appendix B:

Analysis Worksheets for Existing Conditions

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.341
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        35                Level Of Service:                   A
******************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     180  306    15     4  374   109    97    6   189    32    6     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  180  306    15     4  374   109    97    6   189    32    6     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   180  306    15     4  374   109    97    6   189    32    6     4
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  180  306    15     4  374   109    97    6   189    32    6     4
RTOR Reduct:    0    0    15     0    0     0     0    0   180     0    0     4
RTOR Vol:     180  306     0     4  374   109    97    6     9    32    6     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  180  306     0     4  374   109    97    6     9    32    6     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 1.55  0.45  0.94 0.06  1.00  0.84 0.16  1.00
Final Sat.:  1650 1650  1650  1650 2555   745  1554   96  1650  1389  261  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.19  0.00  0.00 0.15  0.15  0.06 0.06  0.01  0.02 0.02  0.00
Crit Volume:  180                  242              103               38
Crit Moves:  ****                 ****             ****             ****
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: B[ 12.3]
******************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      12  502     0     0  590     6     3    0     8     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   12  502     0     0  590     6     3    0     8     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    12  502     0     0  590     6     3    0     8     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   12  502     0     0  590     6     3    0     8     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  596 xxxx xxxxx  xxxx xxxx xxxxx  1119 1119   593  xxxx xxxx xxxxx
Potent Cap.:  990 xxxx xxxxx  xxxx xxxx xxxxx   231  209   509  xxxx xxxx xxxxx
Move Cap.:    990 xxxx xxxxx  xxxx xxxx xxxxx   229  206   509  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   491  438 xxxxx   424  432 xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.02  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  8.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  504 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.3 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    B     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             12.3            xxxxxx
ApproachLOS:        *                *                B                 *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: B[ 12.4]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       3  504     0     0  590     6     6    0    12     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    3  504     0     0  590     6     6    0    12     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     3  504     0     0  590     6     6    0    12     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    3  504     0     0  590     6     6    0    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  596 xxxx xxxxx  xxxx xxxx xxxxx  1103 1103   593  xxxx xxxx xxxxx
Potent Cap.:  990 xxxx xxxxx  xxxx xxxx xxxxx   236  213   509  xxxx xxxx xxxxx
Move Cap.:    990 xxxx xxxxx  xxxx xxxx xxxxx   235  212   509  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   497  444 xxxxx   430  441 xxxxx
Volume/Cap:  0.00 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.02  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  8.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  505 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.4 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    B     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx             12.4            xxxxxx
ApproachLOS:        *                 *                B               *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: C[ 16.8]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  519     7    31  578     0     0    0     0     1    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  519     7    31  578     0     0    0     0     1    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  519     7    31  578     0     0    0     0     1    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  519     7    31  578     0     0    0     0     1    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   526 xxxx xxxxx  xxxx xxxx xxxxx  1163 1163   523
Potent Cap.: xxxx xxxx xxxxx  1051 xxxx xxxxx  xxxx xxxx xxxxx   217  197   558
Move Cap.:   xxxx xxxx xxxxx  1051 xxxx xxxxx  xxxx xxxx xxxxx   212  191   558
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   8.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  308 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 16.8 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              16.8
ApproachLOS:        *                 *                 *                  C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.527
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        48                 Level Of Service:                   A
********************************************************************************
Street Name:         Brentwood Blvd.              Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10   10     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60  374   98    67  465   42    48   42   69   148   44  102
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   60  374   98    67  465   42    48   42   69   148   44  102
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    60  374   98    67  465   42    48   42   69   148   44  102
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   60  374   98    67  465   42    48   42   69   148   44  102
RTOR Reduct:    0    0   98     0    0    0     0    0    0     0    0   67
RTOR Vol:      60  374    0    67  465   42    48   42   69   148   44   35
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   60  374    0    67  465   42    48   42   69   148   44   35
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.00 1.00  1.00 0.92 0.08  1.00 0.38 0.62  0.77 0.23 1.00
Final Sat.:  1650 1650 1650  1650 1513  137  1650  624 1026  1272  378 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.23 0.00  0.04 0.31 0.31  0.03 0.07 0.07  0.12 0.12 0.02
Crit Volume:   60                       507        111              192
Crit Moves:  ****                       ****       ****             ****
********************************************************************************
```



```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: B[ 11.6]
********************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  536     1     0  691     0     0    0     0     0    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  536     1     0  691     0     0    0     0     0    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  536     1     0  691     0     0    0     0     0    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  536     1     0  691     0     0    0     0     0    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   537
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   548
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   548
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.0
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  11.6
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              11.6
ApproachLOS:        *                *                *                   B
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      0.8       Worst Case Level Of Service: C[ 19.1]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10  527    21    11  665    15     0    0    18    24    2    12
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10  527    21    11  665    15     0    0    18    24    2    12
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10  527    21    11  665    15     0    0    18    24    2    12
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   10  527    21    11  665    15     0    0    18    24    2    12
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  680 xxxx xxxxx   548 xxxx xxxxx  xxxx xxxx   340   902 1249   527
Potent Cap.:  922 xxxx xxxxx  1032 xxxx xxxxx  xxxx xxxx   707   261  175   555
Move Cap.:    922 xxxx xxxxx  1032 xxxx xxxxx  xxxx xxxx   707   250  171   555
Volume/Cap:  0.01 xxxx  xxxx  0.01 xxxx  xxxx  xxxx xxxx  0.03  0.10 0.01  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx   0.1  xxxx xxxx xxxxx
Control Del:  8.9 xxxx xxxxx   8.5 xxxx xxxxx xxxxx xxxx  10.2 xxxxx xxxx xxxxx
LOS by Move:   A    *     *     A    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  294 xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.4 xxxxx
Shrd ConDel:  8.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 19.1 xxxxx
Shared LOS:    A    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx            xxxxxx             10.2              19.1
ApproachLOS:        *                 *                 B                 C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.239
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        25                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                  Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  522    14     2  685    10    23    0    21    28    0    10
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   15  522    14     2  685    10    23    0    21    28    0    10
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    15  522    14     2  685    10    23    0    21    28    0    10
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   15  522    14     2  685    10    23    0    21    28    0    10
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     2
RTOR Vol:      15  522    14     2  685    10    23    0    21    28    0     8
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   15  522    14     2  685    10    23    0    21    28    0     8
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.95  0.05  1.00 1.97  0.03  1.00 0.00  1.00  1.00 0.00  1.00
Final Sat.:  1720 3350    90  1720 3391    49  1720    0  1720  1720    0  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.16  0.16  0.00 0.20  0.20  0.01 0.00  0.01  0.02 0.00  0.00
Crit Volume:   15                          348                 21    28
Crit Moves:  ****                         ****               ****  ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.353
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 29 Level Of Service: A

Street Name:	Brentwood Blvd.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			0	0	0		
Lanes:	1	0	2	0	0	1	0	1	1	0	1	0	0	0	1	0	0	0	0	0
Volume Module:																														
Base Vol:	147	409		0		18	547	134			119		0	92		0		0	0	
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	147	409		0		18	547	134			119		0	92		0		0	0	
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	147	409		0		18	547	134			119		0	92		0		0	0	
Reduct Vol:	0	0		0		0	0	0			0		0	0		0		0	0	
Reduced Vol:	147	409		0		18	547	134			119		0	92		0		0	0	
RTOR Reduct:	0	0		0		0	0	0			0		0	92		0		0	0	
RTOR Vol:	147	409		0		18	547	134			119		0	0		0		0	0	
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	147	409		0		18	547	134			119		0	0		0		0	0	
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.61	0.39	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Sat.:	1720	3440		0	1720	2763	677	1720		0	1720		0	1720		0		0	0	
Capacity Analysis Module:																														
Vol/Sat:	0.09	0.12	0.00	0.01	0.20	0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crit Volume:	147					341	119							0						
Crit Moves:	****					****	****													

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.225
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 29 Level Of Service: A

Street Name:	Brentwood Blvd.								Technology Way							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			0	0	0		
Lanes:	1	0	2	0	0	0	0	1	1	0	0	0	1!	0	0	0	0	0	0	0
Volume Module:																														
Base Vol:	25	559		0		0	629	14			14		0	26		0		0	0	
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	25	559		0		0	629	14			14		0	26		0		0	0	
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	25	559		0		0	629	14			14		0	26		0		0	0	
Reduct Vol:	0	0		0		0	0	0			0		0	0		0		0	0	
Reduced Vol:	25	559		0		0	629	14			14		0	26		0		0	0	
RTOR Reduct:	0	0		0		0	0	0			0		0	0		0		0	0	
RTOR Vol:	25	559		0		0	629	14			14		0	26		0		0	0	
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	25	559		0		0	629	14			14		0	26		0		0	0	
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.96	0.04	0.35	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Sat.:	1720	3440		0	0	3365	75	602		0	1118		0	0		0		0	0	
Capacity Analysis Module:																														
Vol/Sat:	0.01	0.16	0.00	0.00	0.19	0.19	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crit Volume:	25					322	40							0						
Crit Moves:	****					****	****													

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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: B[ 14.5]
********************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  544    37    22  625     0     0    0     0    19    0    27
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  544    37    22  625     0     0    0     0    19    0    27
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  544    37    22  625     0     0    0     0    19    0    27
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  544    37    22  625     0     0    0     0    19    0    27
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   581 xxxx xxxxx  xxxx xxxx xxxxx   919 1232   291
Potent Cap.: xxxx xxxx xxxxx  1003 xxxx xxxxx  xxxx xxxx xxxxx   274  179   712
Move Cap.:   xxxx xxxx xxxxx  1003 xxxx xxxxx  xxxx xxxx xxxxx   270  175   712
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.07 0.00  0.04
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   8.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  424 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.4 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 14.5 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              14.5
ApproachLOS:        *                 *                 *                  B
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```



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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.290
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
********************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      33  377    39    65  481    85    78   55    31    40   84   124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   33  377    39    65  481    85    78   55    31    40   84   124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    33  377    39    65  481    85    78   55    31    40   84   124
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   33  377    39    65  481    85    78   55    31    40   84   124
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    65
RTOR Vol:      33  377    39    65  481    85    78   55    31    40   84    59
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   33  377    39    65  481    85    78   55    31    40   84    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.81  0.19  1.00 1.70  0.30  1.00 1.28  0.72  1.00 1.00  1.00
Final Sat.:  1650 2991   309  1650 2804   496  1650 2110  1190  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.13  0.13  0.04 0.17  0.17  0.05 0.03  0.03  0.02 0.05  0.04
Crit Volume:   33                    283           78                     84
Crit Moves:  ****                 ****         ****                   ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.314
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 33 Level Of Service: A

Street Name:	O'hara Ave.							Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound		
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected				
Rights:	Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2
Volume Module:															
Base Vol:	113	208		31		48	321		124		163	223		289	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	113	208		31		48	321		124		163	223		289	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	113	208		31		48	321		124		163	223		289	
Reduct Vol:	0	0		0		0	0		0		0	0		0	
Reduced Vol:	113	208		31		48	321		124		163	223		289	
RTOR Reduct:	0	0		31		0	0		124		0	0		113	
RTOR Vol:	113	208		0		48	321		0		163	223		176	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	113	208		0		48	321		0		163	223		176	
Saturation Flow Module:															
Sat/Lane:	1650	1650		1650		1650	1650		1650		1650	1650		1650	
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		0.91	
Lanes:	1.00	1.00		1.00		1.00	2.00		1.00		1.00	2.00		2.00	
Final Sat.:	1650	1650		1650		1650	3300		1650		1650	3300		3000	
Capacity Analysis Module:															
Vol/Sat:	0.07	0.13		0.00		0.03	0.10		0.00		0.10	0.07		0.06	
Crit Volume:		208				48					163				
Crit Moves:		****				****					****				

Approach:	East Bound				West Bound							
Movement:	L	-	T	-	R	L	-	T	-	R		
Control:	Protected					Protected						
Rights:	Include					Include						
Min. Green:	4	4	4			4	4	4				
Lanes:	1	0	2	0	2	1	0	2	0	1		
Volume Module:												
Base Vol:	32	198		33								
Growth Adj:	1.00	1.00		1.00								
Initial Bse:	32	198		33								
User Adj:	1.00	1.00		1.00								
PHF Adj:	1.00	1.00		1.00								
PHF Volume:	32	198		33								
Reduct Vol:	0	0		0								
Reduced Vol:	32	198		33								
RTOR Reduct:	0	0		33								
RTOR Vol:	32	198		0								
PCE Adj:	1.00	1.00		1.00								
MLF Adj:	1.00	1.00		1.00								
FinalVolume:	32	198		0								
Saturation Flow Module:												
Sat/Lane:	1650	1650		1650								
Adjustment:	1.00	1.00		1.00								
Lanes:	1.00	2.00		1.00								
Final Sat.:	1650	3300		1650								
Capacity Analysis Module:												
Vol/Sat:	0.02	0.06		0.00								
Crit Volume:		99										
Crit Moves:		****										

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                      Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
******************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.378
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        37                 Level Of Service:                   A
******************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     210  452   16     9  451  102   111   22  253    19   10    9
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  210  452   16     9  451  102   111   22  253    19   10    9
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   210  452   16     9  451  102   111   22  253    19   10    9
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  210  452   16     9  451  102   111   22  253    19   10    9
RTOR Reduct:    0    0   16     0    0    0     0    0  210     0    0    9
RTOR Vol:     210  452    0     9  451  102   111   22   43    19   10    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  210  452    0     9  451  102   111   22   43    19   10    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.00 1.00  1.00 1.63 0.37  0.83 0.17 1.00  0.66 0.34 1.00
Final Sat.:  1650 1650 1650  1650 2691  609  1377  273 1650  1081  569 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.27 0.00  0.01 0.17 0.17  0.08 0.08 0.03  0.02 0.02 0.00
Crit Volume:       452            9                   133               29
Crit Moves:       ****        ****                  ****             ****
******************************************************************************
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                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.4       Worst Case Level Of Service: B[ 14.2]
******************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  651    0     0  704   15    20    0   12     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   15  651    0     0  704   15    20    0   12     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    15  651    0     0  704   15    20    0   12     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
FinalVolume:   15  651    0     0  704   15    20    0   12     0    0    0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  719 xxxx xxxxx  xxxx xxxx xxxxx  1393 1393   712  xxxx xxxx xxxxx
Potent Cap.:  892 xxxx xxxxx  xxxx xxxx xxxxx   158  143   436  xxxx xxxx xxxxx
Move Cap.:    892 xxxx xxxxx  xxxx xxxx xxxxx   156  141   436  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   416  373 xxxxx   346  365 xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.05 0.00  0.03  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  423 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.2 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 14.2 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    B     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             14.2           xxxxxx
ApproachLOS:        *                *                B                *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: B[ 13.7]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      11  646     0     0  706     5     9    0     8     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   11  646     0     0  706     5     9    0     8     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    11  646     0     0  706     5     9    0     8     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   11  646     0     0  706     5     9    0     8     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  711 xxxx xxxxx  xxxx xxxx xxxxx  1377 1377   709  xxxx xxxx xxxxx
Potent Cap.:  898 xxxx xxxxx  xxxx xxxx xxxxx   161  146   438  xxxx xxxx xxxxx
Move Cap.:    898 xxxx xxxxx  xxxx xxxx xxxxx   160  145   438  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   421  377 xxxxx   355  372 xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.02 0.00  0.02  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  429 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 13.7 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    B     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx             13.7            xxxxxx
ApproachLOS:        *                 *                B               *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: C[ 18.5]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  668    18    15  706     0     0    0     0     2    0     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  668    18    15  706     0     0    0     0     2    0     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  668    18    15  706     0     0    0     0     2    0     4
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0  668    18    15  706     0     0    0     0     2    0     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   686 xxxx xxxxx  xxxx xxxx xxxxx  1413 1413   677
Potent Cap.: xxxx xxxx xxxxx   917 xxxx xxxxx  xxxx xxxx xxxxx   153  139   456
Move Cap.:   xxxx xxxx xxxxx   917 xxxx xxxxx  xxxx xxxx xxxxx   152  137   456
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   9.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  273 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 18.5 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              18.5
ApproachLOS:        *                 *                 *                  C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
******************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.579
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        54                 Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.              Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10    10     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      32  524   156   124  541    30    26   43    48   163   53   134
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32  524   156   124  541    30    26   43    48   163   53   134
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    32  524   156   124  541    30    26   43    48   163   53   134
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   32  524   156   124  541    30    26   43    48   163   53   134
RTOR Reduct:    0    0   156     0    0     0     0    0     0     0    0   124
RTOR Vol:      32  524     0   124  541    30    26   43    48   163   53    10
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   32  524     0   124  541    30    26   43    48   163   53    10
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 0.95  0.05  1.00 0.47  0.53  0.75 0.25  1.00
Final Sat.:  1650 1650  1650  1650 1563    87  1650  780   870  1245  405  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.32  0.00  0.08 0.35  0.35  0.02 0.06  0.06  0.13 0.13  0.01
Crit Volume:       524         124                          91        216
Crit Moves:       ****        ****                        ****       ****
******************************************************************************
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------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
******************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: B[ 13.3]
******************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  713     0     0  780     0     0    0     0     0    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  713     0     0  780     0     0    0     0     0    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  713     0     0  780     0     0    0     0     0    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  713     0     0  780     0     0    0     0     0    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   713
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   435
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   435
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.0
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  13.3
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              13.3
ApproachLOS:        *                *                *                  B
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      0.5       Worst Case Level Of Service: C[ 21.6]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       3  702    27    24  746    10     0    0     7    12    0     9
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    3  702    27    24  746    10     0    0     7    12    0     9
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     3  702    27    24  746    10     0    0     7    12    0     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    3  702    27    24  746    10     0    0     7    12    0     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  756 xxxx xxxxx   729 xxxx xxxxx  xxxx xxxx   378  1129 1512   702
Potent Cap.:  864 xxxx xxxxx   884 xxxx xxxxx  xxxx xxxx   673   183  121   442
Move Cap.:    864 xxxx xxxxx   884 xxxx xxxxx  xxxx xxxx   673   177  117   442
Volume/Cap:  0.00 xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  0.01  0.07 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx   0.0  xxxx xxxx xxxxx
Control Del:  9.2 xxxx xxxxx   9.2 xxxx xxxxx xxxxx xxxx  10.4 xxxxx xxxx xxxxx
LOS by Move:   A    *     *     A    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  238 xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx
Shrd ConDel:  9.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 21.6 xxxxx
Shared LOS:    A    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx            xxxxxx              10.4              21.6
ApproachLOS:        *                 *                  B                 C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.258
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        25                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                  Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21  729    31    10  727    14     2    0    23    31    1     7
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21  729    31    10  727    14     2    0    23    31    1     7
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21  729    31    10  727    14     2    0    23    31    1     7
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21  729    31    10  727    14     2    0    23    31    1     7
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     7
RTOR Vol:      21  729    31    10  727    14     2    0    23    31    1     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   21  729    31    10  727    14     2    0    23    31    1     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.92  0.08  1.00 1.96  0.04  1.00 0.00  1.00  0.97 0.03  1.00
Final Sat.:  1720 3300   140  1720 3375    65  1720    0  1720  1666   54  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.22  0.22  0.01 0.22  0.22  0.00 0.00  0.01  0.02 0.02  0.00
Crit Volume:        380          10                          23    31
Crit Moves:       ****        ****                        ****  ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.439
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 33 Level Of Service: A

Street Name:	Brentwood Blvd.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			0	0	0		
Lanes:	1	0	2	0	0	1	0	1	1	0	1	0	0	0	1	0	0	0	0	0
Volume Module:																														
Base Vol:	180	564		0		34	598	171			190		0	166		0		0		0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	180	564		0		34	598	171			190		0	166		0		0		0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	180	564		0		34	598	171			190		0	166		0		0		0
Reduct Vol:	0	0		0		0	0	0			0		0	0		0		0		0
Reduced Vol:	180	564		0		34	598	171			190		0	166		0		0		0
RTOR Reduct:	0	0		0		0	0	0			0		0	166		0		0		0
RTOR Vol:	180	564		0		34	598	171			190		0	0		0		0		0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	180	564		0		34	598	171			190		0	0		0		0		0
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.56	0.44	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Sat.:	1720	3440		0	1720	2675	765	1720		0	1720		0	0		0		0		0
Capacity Analysis Module:																														
Vol/Sat:	0.10	0.16	0.00	0.02	0.22	0.22	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crit Volume:	180					385	190						0							
Crit Moves:	****					****	****													

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.270
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 31 Level Of Service: A

Street Name:	Brentwood Blvd.								Technology Way							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			0	0	0		
Lanes:	1	0	2	0	0	0	0	1	1	0	0	0	1!	0	0	0	0	0	0	0
Volume Module:																														
Base Vol:	36	721		0		0	763	15			14		0	25		0		0		0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	36	721		0		0	763	15			14		0	25		0		0		0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	36	721		0		0	763	15			14		0	25		0		0		0
Reduct Vol:	0	0		0		0	0	0			0		0	0		0		0		0
Reduced Vol:	36	721		0		0	763	15			14		0	25		0		0		0
RTOR Reduct:	0	0		0		0	0	0			0		0	0		0		0		0
RTOR Vol:	36	721		0		0	763	15			14		0	25		0		0		0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	36	721		0		0	763	15			14		0	25		0		0		0
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.00	1.96	0.04	0.36	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Sat.:	1720	3440		0	0	3374	66	617		0	1103		0	0		0		0		0
Capacity Analysis Module:																														
Vol/Sat:	0.02	0.21	0.00	0.00	0.23	0.23	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crit Volume:	36					389			39						0					
Crit Moves:	****					****			****											

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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
******************************************************************************
Average Delay (sec/veh):      1.3       Worst Case Level Of Service: C[ 19.5]
******************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  688    50    58  698     0     0    0     0    28    0    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  688    50    58  698     0     0    0     0    28    0    46
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  688    50    58  698     0     0    0     0    28    0    46
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  688    50    58  698     0     0    0     0    28    0    46
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   738 xxxx xxxxx  xxxx xxxx xxxxx  1178 1527   369
Potent Cap.: xxxx xxxx xxxxx   877 xxxx xxxxx  xxxx xxxx xxxxx   187  119   634
Move Cap.:   xxxx xxxx xxxxx   877 xxxx xxxxx  xxxx xxxx xxxxx   177  111   634
Volume/Cap:  xxxx xxxx  xxxx  0.07 xxxx  xxxx  xxxx xxxx  xxxx  0.16 0.00  0.07
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   9.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  321 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.9 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 19.5 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              19.5
ApproachLOS:        *                 *                 *                  C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.333
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15   15     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      34  507    38   114  520    95   104   77   34    33   59  109
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   34  507    38   114  520    95   104   77   34    33   59  109
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    34  507    38   114  520    95   104   77   34    33   59  109
Reduct Vol:     0    0     0     0    0     0     0    0    0     0    0    0
Reduced Vol:   34  507    38   114  520    95   104   77   34    33   59  109
RTOR Reduct:    0    0     0     0    0     0     0    0    0     0    0  109
RTOR Vol:      34  507    38   114  520    95   104   77   34    33   59    0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   34  507    38   114  520    95   104   77   34    33   59    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.86  0.14  1.00 1.69  0.31  1.00 1.39  0.61  1.00 1.00  1.00
Final Sat.:  1650 3070   230  1650 2790   510  1650 2289  1011  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.17  0.17  0.07 0.19  0.19  0.06 0.03  0.03  0.02 0.04  0.00
Crit Volume:             273   114              104                     59
Crit Moves:             ****  ****             ****                   ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.421
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 39 Level Of Service: A

Street Name:	O'hara Ave.							Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound		
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected				
Rights:	Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2
Volume Module:															
Base Vol:	282	340		34		61	286		121		99	290		138	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	282	340		34		61	286		121		99	290		138	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	282	340		34		61	286		121		99	290		138	
Reduct Vol:	0	0		0		0	0		0		0	0		0	
Reduced Vol:	282	340		34		61	286		121		99	290		138	
RTOR Reduct:	0	0		34		0	0		99		0	0		138	
RTOR Vol:	282	340		0		61	286		22		99	290		0	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	282	340		0		61	286		22		99	290		0	
Saturation Flow Module:															
Sat/Lane:	1650	1650		1650		1650	1650		1650		1650	1650		1650	
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		0.91	
Lanes:	1.00	1.00		1.00		2.00	1.00		1.00		2.00	2.00		1.00	
Final Sat.:	1650	1650		1650		1650	3300		1650		1650	3300		3000	
Capacity Analysis Module:															
Vol/Sat:	0.17	0.21		0.00		0.04	0.09		0.01		0.06	0.09		0.00	
Crit Volume:	282						143				99				
Crit Moves:	****						****				****				

Scenario Report

Scenario:	Existing AM
Command:	Default
Volume:	Existing AM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12		502		0	0		590		6	3		0		8	0		0		0
ApproachDel:	xxxxxx					xxxxxx					14.7					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=11]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1121]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12		502		0	0		590		6	3		0		8	0		0		0

Major Street Volume: 1110
Minor Approach Volume: 11
Minor Approach Volume Threshold: 249

SIGNAL WARRANT DISCLAIMER
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```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    3  504     0     0  590     6     6    0    12     0    0     0
ApproachDel:    xxxxxx           xxxxxx             15.3           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=18]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1121]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    3  504     0     0  590     6     6    0    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1103
Minor Approach Volume:           18
Minor Approach Volume Threshold: 251
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  519     7    31  578     0     0    0     0     1    0     1
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             16.8
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=2]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1137]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  519     7    31  578     0     0    0     0     1    0     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1135
Minor Approach Volume:           2
Minor Approach Volume Threshold: 241
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0  536     1     0  691     0     0    0     0     0    0     1
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             11.6
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=1]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1229]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0  536     1     0  691     0     0    0     0     0    0     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1228
Minor Approach Volume:           1
Minor Approach Volume Threshold: 214
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
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signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   10  527    21    11  665    15     4    0    14    24    2    12
ApproachDel:    xxxxxx           xxxxxx             15.1             19.0
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=18]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1305]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
-------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=38]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1305]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
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signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                    Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   10  527    21    11  665    15     4    0    14    24    2    12
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1249
Minor Approach Volume:           38
Minor Approach Volume Threshold: 208
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
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```

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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  544    37    22  625     0     0    0     0    19    0    27
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             14.5
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=46]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1274]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
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signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  544    37    22  625     0     0    0     0    19    0    27
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1228
Minor Approach Volume:           46
Minor Approach Volume Threshold: 214
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
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```

Scenario Report

Scenario:	Existing PM
Command:	Default
Volume:	Existing PM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

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Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	15	651		0	0	704		15	20		0	12	0		0	0
ApproachDel:	xxxxxx				xxxxxx				25.7				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=32]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1417]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

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```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   15  651     0     0  704    15    20    0    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1385
Minor Approach Volume:           32
Minor Approach Volume Threshold: 173
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
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```



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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   11  646     0     0  706     5     9    0     8     0    0     0
ApproachDel:    xxxxxx           xxxxxx             22.1            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=17]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1385]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	11		646		0	0		706		5	9		0		8	0		0		0

Major Street Volume: 1368
Minor Approach Volume: 17
Minor Approach Volume Threshold: 177

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0		668		18	15		706		0	0		0		0	2		0		4
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					18.5				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1413]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  668    18    15  706     0     0     0     0     2     0     4
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1407
Minor Approach Volume:           6
Minor Approach Volume Threshold: 167
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                      Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0  713     0     0  780     0     0     0     0     0     0     1
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              13.3
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=1]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1494]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0  713     0     0  780     0     0     0     0     0     0     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1493
Minor Approach Volume:           1
Minor Approach Volume Threshold: 147
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:    3  702    27    24  746    10     1     1     5    12     0     9
ApproachDel:    xxxxxx           xxxxxx             19.2             21.7
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=7]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1540]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
-------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=21]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1540]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
*******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:    3  702    27    24  746    10     1    1     5    12    0     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1512
Minor Approach Volume:           21
Minor Approach Volume Threshold: 142
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



```
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
*******************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  688    50    58  698     0     0    0     0    28    0    46
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              19.5
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=74]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1568]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
-------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0		688		50	58		698		0	0		0		0	28		0		46

Major Street Volume: 1494
Minor Approach Volume: 74
Minor Approach Volume Threshold: 147

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

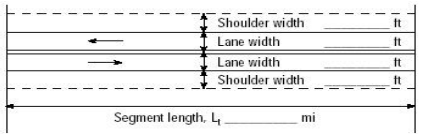
The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*AM Peak*	Analysis Year	*Existing*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*587* veh/h
Directional split	*50 / 50*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*648*
v_p * highest directional split proportion[2] (pc/h)	*324*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.7*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*26.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*646*
v_p * highest directional split proportion[2] (pc/h)	*323*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*43.3*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*19.3*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*62.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.20*
Peak 15-min veh-miles of travel,VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*32*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*117*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*1.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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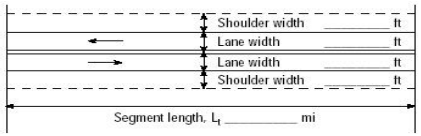
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*PM Peak*	Analysis Year	*Existing*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*708* veh/h
Directional split	*55 / 45*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*781*
v_p * highest directional split proportion[2] (pc/h)	*430*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.1*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*25.9*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*780*
v_p * highest directional split proportion[2] (pc/h)	*429*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*49.6*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*15.5*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*65.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.24*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*39*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*142*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*1.5*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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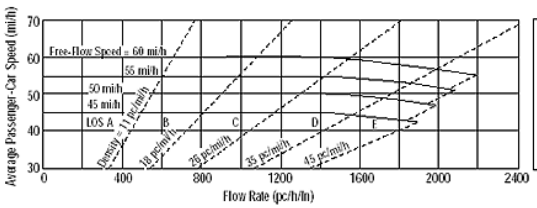
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	528	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	294
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.5
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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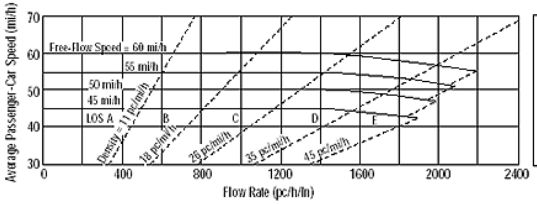
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	699	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	390
Speed, S (mi/h)	45.0
D (pc/mi/ln)	8.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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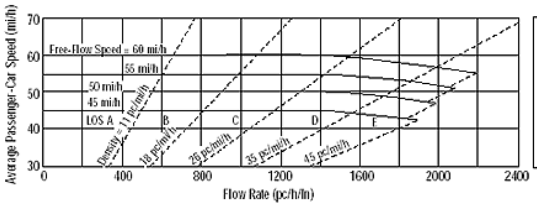
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	754	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	425
Speed, S (mi/h)	45.0
D (pc/mi/ln)	9.4
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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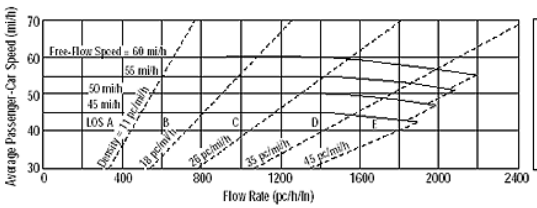
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	803	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	453
Speed, S (mi/h)	45.0
D (pc/mi/ln)	10.1
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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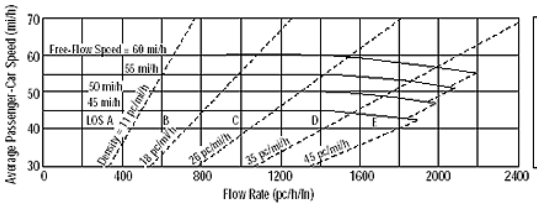
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	211	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	125
Speed, S (mi/h)	45.0
D (pc/mi/ln)	2.8
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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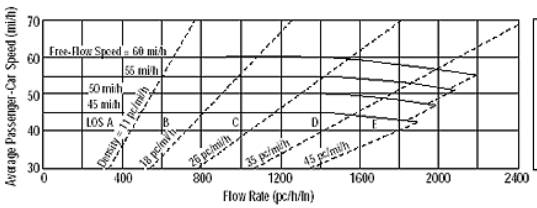
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	281	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	167
Speed, S (mi/h)	45.0
D (pc/mi/ln)	3.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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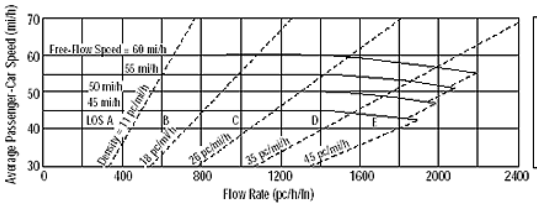
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	356	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	205
Speed, S (mi/h)	45.0
D (pc/mi/ln)	4.6
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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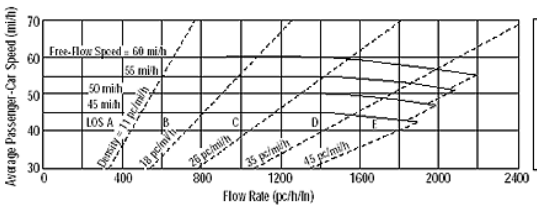
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	351	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	202
Speed, S (mi/h)	45.0
D (pc/mi/ln)	4.5
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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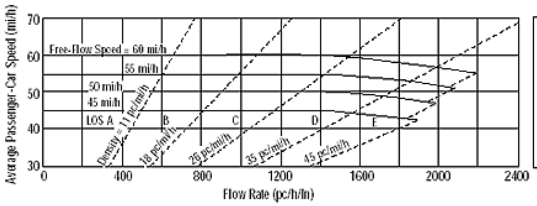
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	556	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	300
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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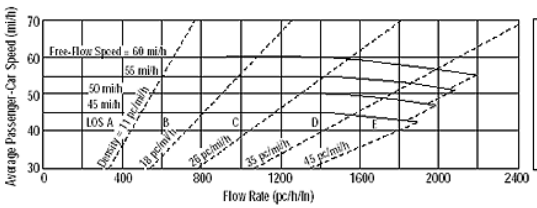
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	639	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	345
Speed, S (mi/h)	45.0
D (pc/mi/ln)	7.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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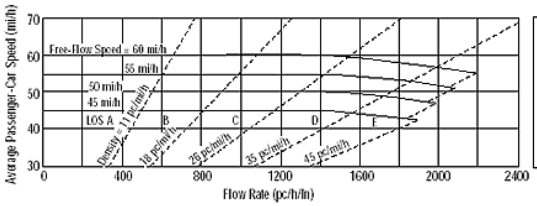
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	744	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	429
Speed, S (mi/h)	45.0
D (pc/mi/ln)	9.5
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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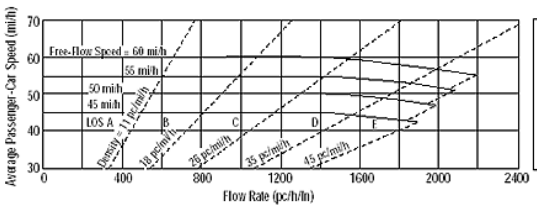
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	764	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	440
Speed, S (mi/h)	45.0
D (pc/mi/ln)	9.8
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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Appendix C:

Analysis Worksheets for
Existing plus Approved Projects Conditions

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #1 Brentwood Blvd @ Lone Tree Way (S)

Cycle (sec): 100 Critical Vol./Cap.(X): 0.398
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 38 Level Of Service: A

Street Name:	Brentwood Blvd									Lone Tree Way (S)							
Approach:	North Bound				South Bound				East Bound				West Bound				
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R		
Control:	Protected				Protected				Split Phase				Split Phase				
Rights:	Include				Include				Ovl				Include				
Min. Green:	4	8	8		4	8	8		4	4	4		4	4	4		
Lanes:	1	0 1	0	1	1	0 1	1	0	0	1 0	0	1	0	1 0	0	1	
Volume Module:																	
Base Vol:	241	367	15		4	441	109		97	6	256		32	6	4		
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Initial Bse:	241	367	15		4	441	109		97	6	256		32	6	4		
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
PHF Volume:	241	367	15		4	441	109		97	6	256		32	6	4		
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0		
Reduced Vol:	241	367	15		4	441	109		97	6	256		32	6	4		
RTOR Reduct:	0	0	15		0	0	0		0	0	241		0	0	4		
RTOR Vol:	241	367	0		4	441	109		97	6	15		32	6	0		
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
FinalVolume:	241	367	0		4	441	109		97	6	15		32	6	0		
Saturation Flow Module:																	
Sat/Lane:	1650	1650	1650		1650	1650	1650		1650	1650	1650		1650	1650	1650		
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Lanes:	1.00	1.00	1.00		1.00	1.60	0.40		0.94	0.06	1.00		0.84	0.16	1.00		
Final Sat.:	1650	1650	1650		1650	2646	654		1554	96	1650		1389	261	1650		
Capacity Analysis Module:																	
Vol/Sat:	0.15	0.22	0.00		0.00	0.17	0.17		0.06	0.06	0.01		0.02	0.02	0.00		
Crit Volume:	241					275				103				38			
Crit Moves:	****					****				****				****			

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: B[13.7]

Street Name:	Brentwood Blvd.									Sunrise Dr.							
Approach:	North Bound				South Bound				East Bound				West Bound				
Movement:	L	- T	- R		L	- T	- R		L	- T	- R		L	- T	- R		
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign				
Rights:	Include				Include				Include				Include				
Lanes:	1	0 1	0	0	0	0 0	1	0	0	0 1!	0	0	0	0 0	0	0	
Volume Module:																	
Base Vol:	12	632	0		0	723	6		3	0	8		0	0	0		
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Initial Bse:	12	632	0		0	723	6		3	0	8		0	0	0		
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
PHF Volume:	12	632	0		0	723	6		3	0	8		0	0	0		
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0		
FinalVolume:	12	632	0		0	723	6		3	0	8		0	0	0		
Critical Gap Module:																	
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx			6.4	6.5			6.2	xxxxx	xxxx	xxxxx	
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx			3.5	4.0			3.3	xxxxx	xxxx	xxxxx	
Capacity Module:																	
Cnflict Vol:	729	xxxx	xxxxx	xxxx	xxxx	xxxxx			1382	1382			726	xxxx	xxxx	xxxxx	
Potent Cap.:	884	xxxx	xxxxx	xxxx	xxxx	xxxxx			160	145			428	xxxx	xxxx	xxxxx	
Move Cap.:	884	xxxx	xxxxx	xxxx	xxxx	xxxxx			159	143			428	xxxx	xxxx	xxxxx	
Total Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx			419	375			xxxxx	351	369	xxxxx	
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx			0.01	0.00			0.02	xxxx	xxxx	xxxx	
Level Of Service Module:																	
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx			xxxx	xxxx			xxxxx	xxxx	xxxx	xxxxx	
Control Del:	9.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx			xxxxx	xxxx			xxxxx	xxxxx	xxxx	xxxxx	
LOS by Move:	A	*	*	*	*	*			*	*			*	*	*		
Movement:	LT -	LTR -	RT	LT -	LTR -	RT			LT -	LTR -	RT		LT -	LTR -	RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx			xxxx	425			xxxxx	xxxx	xxxx	xxxxx	
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx			xxxxx	0.1			xxxxx	xxxxx	xxxx	xxxxx	
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx			xxxxx	13.7			xxxxx	xxxxx	xxxx	xxxxx	
Shared LOS:	*	*	*	*	*	*			*	B			*	*	*		
ApproachDel:	xxxxxx			xxxxxx					13.7				xxxxxx				
ApproachLOS:	*			*					B				*				

Note: Queue reported is the number of cars per lane.

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: B[ 13.8]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       3  634     0     0  723     6     6    0    12     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    3  634     0     0  723     6     6    0    12     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     3  634     0     0  723     6     6    0    12     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    3  634     0     0  723     6     6    0    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  729 xxxx xxxxx  xxxx xxxx xxxxx  1366 1366   726  xxxx xxxx xxxxx
Potent Cap.:  884 xxxx xxxxx  xxxx xxxx xxxxx   164  149   428  xxxx xxxx xxxxx
Move Cap.:    884 xxxx xxxxx  xxxx xxxx xxxxx   163  148   428  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   424  380 xxxxx   357  378 xxxxx
Volume/Cap:  0.00 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.03  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  427 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 13.8 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    B     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx             13.8            xxxxxx
ApproachLOS:        *                 *                B               *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: C[ 21.2]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  649     7    31  711     0     0    0     0     1    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  649     7    31  711     0     0    0     0     1    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  649     7    31  711     0     0    0     0     1    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  649     7    31  711     0     0    0     0     1    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   656 xxxx xxxxx  xxxx xxxx xxxxx  1426 1426   653
Potent Cap.: xxxx xxxx xxxxx   941 xxxx xxxxx  xxxx xxxx xxxxx   151  137   471
Move Cap.:   xxxx xxxx xxxxx   941 xxxx xxxxx  xxxx xxxx xxxxx   147  132   471
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   9.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  224 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 21.2 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              21.2
ApproachLOS:        *                 *                 *                  C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.663
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 68 Level Of Service: B

Street Name:	Brentwood Blvd.						Grant Street / Sunset Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	4	10	10	4	10	10	4	4	4	4	4	4
Lanes:	1 0 1 0 1			1 0 0 1 0			1 0 0 1 0			0 1 0 0 1		
Volume Module:												
Base Vol:	86	404	226	152	495	60	101	42	149	218	44	149
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	86	404	226	152	495	60	101	42	149	218	44	149
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	86	404	226	152	495	60	101	42	149	218	44	149
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	86	404	226	152	495	60	101	42	149	218	44	149
RTOR Reduct:	0	0	218	0	0	0	0	0	0	0	0	149
RTOR Vol:	86	404	8	152	495	60	101	42	149	218	44	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	86	404	8	152	495	60	101	42	149	218	44	0
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.89	0.11	1.00	0.22	0.78	0.83	0.17	1.00
Final Sat.:	1650	1650	1650	1650	1472	178	1650	363	1287	1373	277	1650
Capacity Analysis Module:												
Vol/Sat:	0.05	0.24	0.00	0.09	0.34	0.34	0.06	0.12	0.12	0.16	0.16	0.00
Crit Volume:	86				555				191		262	
Crit Moves:	****				****				****		****	

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: B[13.4]

Street Name:	Brentwood Blvd.									Sunset Ct.		
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 1 0			1 0 1 0 0			0 0 0 0 0			0 0 0 0 1		
Volume Module:												
Base Vol:	0	720	1	0	871	0	0	0	0	0	0	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	720	1	0	871	0	0	0	0	0	0	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	720	1	0	871	0	0	0	0	0	0	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	720	1	0	871	0	0	0	0	0	0	1
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	721
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	431
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	431
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.00
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	0.0
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	13.4
LOS by Move:	*	*	*	*	*	*	*	*	*	*	*	B
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			13.4		
ApproachLOS:	*			*			*			B		

Note: Queue reported is the number of cars per lane.

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Average Delay (sec/veh): 1.1 Worst Case Level Of Service: D[28.9]

Street Name:	Brentwood Blvd.								Havenwood Ave.			
Approach:	North Bound				South Bound				East Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Uncontrolled				Uncontrolled				Stop Sign			
Rights:	Include				Include				Include			
Lanes:	1 0	1	0	1	1 0	1	1	0	0 0	0	0	1
Volume Module:												
Base Vol:	15	701	21		11	842	18		0	0	43	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	15	701	21		11	842	18		0	0	43	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	15	701	21		11	842	18		0	0	43	
Reduct Vol:	0	0	0		0	0	0		0	0	0	
FinalVolume:	15	701	21		11	842	18		0	0	43	
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx		4.1	xxxx	xxxxx	xxxxx	xxxx		6.2	
FollowUpTim:	2.2	xxxx	xxxxx		2.2	xxxx	xxxxx	xxxxx	xxxx		3.3	
Capacity Module:												
Cnflict Vol:	860	xxxx	xxxxx		722	xxxx	xxxxx	xxxx	xxxx		430	
Potent Cap.:	790	xxxx	xxxxx		889	xxxx	xxxxx	xxxx	xxxx		629	
Move Cap.:	790	xxxx	xxxxx		889	xxxx	xxxxx	xxxx	xxxx		629	
Volume/Cap:	0.02	xxxx	xxxx		0.01	xxxx	xxxx	xxxx	xxxx		0.07	

Street Name:	Brentwood Blvd.								Havenwood Ave.			
Approach:	North Bound				South Bound				East Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Uncontrolled				Uncontrolled				Stop Sign			
Rights:	Include				Include				Include			
Lanes:	1 0	1	0	1	1 0	1	1	0	0 0	0	0	1!
Volume Module:												
Base Vol:	15	701	21		11	842	18		0	0	43	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	15	701	21		11	842	18		0	0	43	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	15	701	21		11	842	18		0	0	43	
Reduct Vol:	0	0	0		0	0	0		0	0	0	
FinalVolume:	15	701	21		11	842	18		0	0	43	
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx		4.1	xxxx	xxxxx	xxxxx	xxxx		6.2	
FollowUpTim:	2.2	xxxx	xxxxx		2.2	xxxx	xxxxx	xxxxx	xxxx		3.3	
Capacity Module:												
Cnflict Vol:	860	xxxx	xxxxx		722	xxxx	xxxxx	xxxx	xxxx		430	
Potent Cap.:	790	xxxx	xxxxx		889	xxxx	xxxxx	xxxx	xxxx		629	
Move Cap.:	790	xxxx	xxxxx		889	xxxx	xxxxx	xxxx	xxxx		629	
Volume/Cap:	0.02	xxxx	xxxx		0.01	xxxx	xxxx	xxxx	xxxx		0.07	

Level Of Service Module:												
2Way95thQ:	0.1	xxxx	xxxxx		0.0	xxxx	xxxxx	xxxx	xxxx		0.2	
Control Del:	9.6	xxxx	xxxxx		9.1	xxxx	xxxxx	xxxxx	xxxx		11.1	
LOS by Move:	A	*	*		A	*	*	*	*		B	
Movement:	LT -	LTR -	RT		LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -
Shared Cap.:	xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx		0.7
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx		28.9
Shared LOS:	*	*	*		*	*	*	*	*		*	
ApproachDel:	xxxxxx				xxxxxx			11.1				
ApproachLOS:	*				*			B				

Level Of Service Module:												
2Way95thQ:	0.1	xxxx	xxxxx		0.0	xxxx	xxxxx	xxxx	xxxx		0.2	
Control Del:	9.6	xxxx	xxxxx		9.1	xxxx	xxxxx	xxxxx	xxxx		11.1	
LOS by Move:	A	*	*		A	*	*	*	*		B	
Movement:	LT -	LTR -	RT		LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -
Shared Cap.:	xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx		0.7
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx		28.9
Shared LOS:	*	*	*		*	*	*	*	*		*	
ApproachDel:	xxxxxx				xxxxxx			11.1				
ApproachLOS:	*				*			B				

Note: Queue reported is the number of cars per lane.

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #8 Brentwood Blvd. @ Applewood Common

Cycle (sec): 100 Critical Vol./Cap.(X): 0.295
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 26 Level Of Service: A

Street Name:	Brentwood Blvd.								Applewood Common			
Approach:	North Bound				South Bound				East Bound			
Movement:	L	- T	- R		L	- T	- R		L	- T	- R	
Control:	Protected				Protected				Permitted			
Rights:	Include				Include				Include			
Min. Green:	4	8	8		4	8	8		4	4	4	
Lanes:	1 0	1	1	0	1 0	1	1	0	1 0	0	1	0
Volume Module:												
Base Vol:	15	701	14		2	877	10		23	0	21	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	15	701	14		2	877	10		23	0	21	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	15	701	14		2	877	10		23	0	21	
Reduct Vol:	0	0	0		0	0	0		0	0	0	
Reduced Vol:	15	701	14		2	877	10		23	0	21	
RTOR Reduct:	0	0	0		0	0	0		0	0	0	
RTOR Vol:	15	701	14		2	877	10		23	0	21	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	15	701	14		2	877	10		23	0	21	
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720		1720	1720	1720		1720	1720	1720	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Lanes:	1.00	1.96	0.04		1.00	1.98	0.02		1.00	0.00	1.00	
Final Sat.:	1720	3373	67		1720	3401	39		1720	0	1720	

Capacity Analysis Module:												
Vol/Sat:	0.01	0.21	0.21		0.00	0.26	0.26		0.01	0.00	0.01	
Crit Volume:	15						444				21	
Crit Moves:	****						****				****	

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.453
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 34 Level Of Service: A

Street Name:	Brentwood Blvd.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																														
Base Vol:	151	516	0			18	667	206			191	0	104			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	151	516	0			18	667	206			191	0	104			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	151	516	0			18	667	206			191	0	104			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	151	516	0			18	667	206			191	0	104			0	0	0		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	151	516	0			18	667	206			191	0	104			0	0	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	151	516	0			18	667	206			191	0	104			0	0	0		
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720			1720	1720	1720			1720	1720	1720			1720	1720	1720		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.53	0.47			1.00	1.00	1.00			1.00	2.00	0.00		
Final Sat.:	1720	3440	0			1720	2628	812			1720	1720	1720			1720	3440	0		
Capacity Analysis Module:																														
Vol/Sat:	0.09	0.15	0.00			0.01	0.25	0.25			0.11	0.00	0.06			0.00	0.00	0.00		
Crit Volume:	151						437				191						0			
Crit Moves:	****						****				****									

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.276
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 31 Level Of Service: A

Street Name:	Brentwood Blvd.								Technology Way							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																														
Base Vol:	41	666	0			0	731	43			18	0	28			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	41	666	0			0	731	43			18	0	28			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	41	666	0			0	731	43			18	0	28			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	41	666	0			0	731	43			18	0	28			0	0	0		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	41	666	0			0	731	43			18	0	28			0	0	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	41	666	0			0	731	43			18	0	28			0	0	0		
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720			1720	1720	1720			1720	1720	1720			1720	1720	1720		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.89	0.11			0.39	0.00	0.61			0.00	1.00	0.00		
Final Sat.:	1720	3440	0			1720	3249	191			673	0	1047			0	1720	0		
Capacity Analysis Module:																														
Vol/Sat:	0.02	0.19	0.00			0.00	0.22	0.23			0.03	0.00	0.03			0.00	0.00	0.00		
Crit Volume:	41							387			46						0			
Crit Moves:	****							****			****									

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                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: C[ 17.0]
********************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  667    37    22  730     0     0    0     0    19    0    27
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  667    37    22  730     0     0    0     0    19    0    27
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  667    37    22  730     0     0    0     0    19    0    27
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  667    37    22  730     0     0    0     0    19    0    27
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   704 xxxx xxxxx  xxxx xxxx xxxxx  1095 1460   352
Potent Cap.: xxxx xxxx xxxxx   903 xxxx xxxxx  xxxx xxxx xxxxx   211  130   650
Move Cap.:   xxxx xxxx xxxxx   903 xxxx xxxxx  xxxx xxxx xxxxx   207  127   650
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.09 0.00  0.04
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   9.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  346 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.5 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 17.0 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              17.0
ApproachLOS:        *                 *                 *                  C
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.336
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
********************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      34  477    39    65  570   101   101   55    34    40   84   124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   34  477    39    65  570   101   101   55    34    40   84   124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    34  477    39    65  570   101   101   55    34    40   84   124
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   34  477    39    65  570   101   101   55    34    40   84   124
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    65
RTOR Vol:      34  477    39    65  570   101   101   55    34    40   84    59
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   34  477    39    65  570   101   101   55    34    40   84    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.85  0.15  1.00 1.70  0.30  1.00 1.24  0.76  1.00 1.00  1.00
Final Sat.:  1650 3051   249  1650 2803   497  1650 2039  1261  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.16  0.16  0.04 0.20  0.20  0.06 0.03  0.03  0.02 0.05  0.04
Crit Volume:   34                          336   101                     84
Crit Moves:  ****                         ****  ****                   ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.337
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 34 Level Of Service: A

Street Name:	O'hara Ave.							Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound		
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected				
Rights:	Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2
Volume Module:															
Base Vol:	113	208		31		48	321		124		163	307		289	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	113	208		31		48	321		124		163	307		289	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	113	208		31		48	321		124		163	307		289	
Reduct Vol:	0	0		0		0	0		0		0	0		0	
Reduced Vol:	113	208		31		48	321		124		163	307		289	
RTOR Reduct:	0	0		31		0	0		124		0	0		113	
RTOR Vol:	113	208		0		48	321		0		163	307		176	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	113	208		0		48	321		0		163	307		176	
Saturation Flow Module:															
Sat/Lane:	1650	1650		1650		1650	1650		1650		1650	1650		1650	
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		0.91	
Lanes:	1.00	1.00		1.00		1.00	2.00		1.00		1.00	2.00		2.00	
Final Sat.:	1650	1650		1650		1650	3300		1650		1650	3300		3000	
Capacity Analysis Module:															
Vol/Sat:	0.07	0.13		0.00		0.03	0.10		0.00		0.10	0.09		0.06	
Crit Volume:		208				48					163				
Crit Moves:		****				****					****				

Street Name:															
Approach:															
Movement:															
Control:															
Rights:															
Min. Green:															
Lanes:															
Volume Module:															
Base Vol:															
Growth Adj:															
Initial Bse:															
User Adj:															
PHF Adj:															
PHF Volume:															
Reduct Vol:															
Reduced Vol:															
RTOR Reduct:															
RTOR Vol:															
PCE Adj:															
MLF Adj:															
FinalVolume:															
Saturation Flow Module:															
Sat/Lane:															
Adjustment:															
Lanes:															
Final Sat.:															
Capacity Analysis Module:															
Vol/Sat:															
Crit Volume:															
Crit Moves:															

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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.477
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        44                Level Of Service:                   A
******************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8    4    8    8    4    4    4    4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     309  551   16    9  530  102  111   22  332   19   10    9
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  309  551   16    9  530  102  111   22  332   19   10    9
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   309  551   16    9  530  102  111   22  332   19   10    9
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  309  551   16    9  530  102  111   22  332   19   10    9
RTOR Reduct:    0    0   16    0    0    0    0    0  309    0    0    9
RTOR Vol:     309  551    0    9  530  102  111   22   23   19   10    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:  309  551    0    9  530  102  111   22   23   19   10    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 1.00 1.00 1.00 1.68 0.32 0.83 0.17 1.00 0.66 0.34 1.00
Final Sat.:  1650 1650 1650 1650 2767  533 1377  273 1650 1081  569 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.33 0.00 0.01 0.19 0.19 0.08 0.08 0.01 0.02 0.02 0.00
Crit Volume:  309                 316              133               29
Crit Moves:  ****              ****             ****             ****
******************************************************************************
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------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.4       Worst Case Level Of Service: C[ 16.8]
******************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  859    0    0  878   15   20    0   12    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   15  859    0    0  878   15   20    0   12    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    15  859    0    0  878   15   20    0   12    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
FinalVolume:   15  859    0    0  878   15   20    0   12    0    0    0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx  6.4  6.5  6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx  3.5  4.0  3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  893 xxxx xxxxx  xxxx xxxx xxxxx 1775 1775  886  xxxx xxxx xxxxx
Potent Cap.:  768 xxxx xxxxx  xxxx xxxx xxxxx   92   84  347  xxxx xxxx xxxxx
Move Cap.:    768 xxxx xxxxx  xxxx xxxx xxxxx   91   82  347  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  331  298 xxxxx  264  291 xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx 0.06 0.00  0.03  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  337 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 16.8 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             16.8           xxxxxx
ApproachLOS:        *                *                C                *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: C[ 16.1]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      11  854     0     0  880     5     9    0     8     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   11  854     0     0  880     5     9    0     8     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    11  854     0     0  880     5     9    0     8     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   11  854     0     0  880     5     9    0     8     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  885 xxxx xxxxx  xxxx xxxx xxxxx  1759 1759   883  xxxx xxxx xxxxx
Potent Cap.:  773 xxxx xxxxx  xxxx xxxx xxxxx    94   86   348  xxxx xxxx xxxxx
Move Cap.:    773 xxxx xxxxx  xxxx xxxx xxxxx    93   84   348  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   335  302 xxxxx   271  297 xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.03 0.00  0.02  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  341 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.2 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 16.1 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx              16.1            xxxxxx
ApproachLOS:         *                 *                 C                 *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: D[ 26.3]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  876    18    15  880     0     0    0     0     2    0     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  876    18    15  880     0     0    0     0     2    0     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  876    18    15  880     0     0    0     0     2    0     4
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0  876    18    15  880     0     0    0     0     2    0     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   894 xxxx xxxxx  xxxx xxxx xxxxx  1795 1795   885
Potent Cap.: xxxx xxxx xxxxx   767 xxxx xxxxx  xxxx xxxx xxxxx    89   81   347
Move Cap.:   xxxx xxxx xxxxx   767 xxxx xxxxx  xxxx xxxx xxxxx    88   80   347
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.02 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   9.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  175 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 26.3 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              26.3
ApproachLOS:         *                 *                 *                 D
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
******************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.810
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       120                 Level Of Service:                   D
******************************************************************************
Street Name:         Brentwood Blvd.             Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10   10     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     121  586  238  178  601   89   61   43  101  329   53  245
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  121  586  238  178  601   89   61   43  101  329   53  245
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   121  586  238  178  601   89   61   43  101  329   53  245
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  121  586  238  178  601   89   61   43  101  329   53  245
RTOR Reduct:    0    0  238    0    0    0    0    0    0    0    0  178
RTOR Vol:     121  586    0  178  601   89   61   43  101  329   53   67
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:  121  586    0  178  601   89   61   43  101  329   53   67
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 1.00 1.00 1.00 0.87 0.13 1.00 0.30 0.70 0.86 0.14 1.00
Final Sat.:  1650 1650 1650 1650 1437  213 1650  493 1157 1421  229 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.36 0.00 0.11 0.42 0.42 0.04 0.09 0.09 0.23 0.23 0.04
Crit Volume:  121                 690              144              382
Crit Moves:  ****                ****             ****             ****
******************************************************************************
```



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------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
******************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: C[ 16.3]
******************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  945     0     0 1059     0     0    0     0     0    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  945     0     0 1059     0     0    0     0     0    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  945     0     0 1059     0     0    0     0     0    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  945     0     0 1059     0     0    0     0     0    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   945
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   320
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   320
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.0
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  16.3
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             16.3
ApproachLOS:        *                *                *                 C
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: E[ 37.8]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      19  928    27    24 1015    20     0    0    22    12    0     9
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   19  928    27    24 1015    20     0    0    22    12    0     9
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    19  928    27    24 1015    20     0    0    22    12    0     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   19  928    27    24 1015    20     0    0    22    12    0     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1035 xxxx xxxxx   955 xxxx xxxxx  xxxx xxxx   518  1522 2049   928
Potent Cap.:  679 xxxx xxxxx   728 xxxx xxxxx  xxxx xxxx   562    98   56   328
Move Cap.:    679 xxxx xxxxx   728 xxxx xxxxx  xxxx xxxx   562    90   53   328
Volume/Cap:  0.03 xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  0.04  0.13 0.00  0.03
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx   0.1  xxxx xxxx xxxxx
Control Del: 10.5 xxxx xxxxx  10.1 xxxx xxxxx xxxxx xxxx  11.7 xxxxx xxxx xxxxx
LOS by Move:   B    *     *     B    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  130 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.6 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 37.8 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    E     *
ApproachDel:    xxxxxx            xxxxxx             11.7              37.8
ApproachLOS:        *                 *                 B                 E
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.340
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        28                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                  Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21  971    31    10 1005    14     2    0    23    31    1     7
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21  971    31    10 1005    14     2    0    23    31    1     7
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21  971    31    10 1005    14     2    0    23    31    1     7
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21  971    31    10 1005    14     2    0    23    31    1     7
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     7
RTOR Vol:      21  971    31    10 1005    14     2    0    23    31    1     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   21  971    31    10 1005    14     2    0    23    31    1     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.94  0.06  1.00 1.97  0.03  1.00 0.00  1.00  0.97 0.03  1.00
Final Sat.:  1720 3334   106  1720 3393    47  1720    0  1720  1666   54  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.29  0.29  0.01 0.30  0.30  0.00 0.00  0.01  0.02 0.02  0.00
Crit Volume:   21                          510                 23    31
Crit Moves:  ****                         ****              ****  ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.581
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 44 Level Of Service: A

Street Name:	Brentwood Blvd.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																														
Base Vol:	193	714	0			34	764	283			283	0	172			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	193	714	0			34	764	283			283	0	172			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	193	714	0			34	764	283			283	0	172			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	193	714	0			34	764	283			283	0	172			0	0	0		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	193	714	0			34	764	283			283	0	172			0	0	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	193	714	0			34	764	283			283	0	172			0	0	0		
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720			1720	1720	1720			1720	1720	1720			1720	1720	1720		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.46	0.54			1.00	1.00	1.00			1.00	2.00	0.00		
Final Sat.:	1720	3440	0			1720	2510	930			1720	1720	1720			1720	3440	0		
Capacity Analysis Module:																														
Vol/Sat:	0.11	0.21	0.00			0.02	0.30	0.30			0.16	0.00	0.10			0.00	0.00	0.00		
Crit Volume:	193						524				283						0			
Crit Moves:	****						****				****									

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.345
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 35 Level Of Service: A

Street Name:	Brentwood Blvd.								Technology Way							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																														
Base Vol:	39	856	0			0	930	20			41	0	39			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	39	856	0			0	930	20			41	0	39			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	39	856	0			0	930	20			41	0	39			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	39	856	0			0	930	20			41	0	39			0	0	0		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	39	856	0			0	930	20			41	0	39			0	0	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	39	856	0			0	930	20			41	0	39			0	0	0		
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720			1720	1720	1720			1720	1720	1720			1720	1720	1720		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.96	0.04			0.51	0.00	0.49			0.00	1.00	0.00		
Final Sat.:	1720	3440	0			1720	3368	72			882	0	839			0	1720	0		
Capacity Analysis Module:																														
Vol/Sat:	0.02	0.25	0.00			0.00	0.28	0.28			0.05	0.00	0.05			0.00	0.00	0.00		
Crit Volume:	39							475					80				0			
Crit Moves:	****							****					****							

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
******************************************************************************
Average Delay (sec/veh):      1.3       Worst Case Level Of Service: D[ 26.2]
******************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  826    50    58  880     0     0    0     0    28    0    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  826    50    58  880     0     0    0     0    28    0    46
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  826    50    58  880     0     0    0     0    28    0    46
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  826    50    58  880     0     0    0     0    28    0    46
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   876 xxxx xxxxx  xxxx xxxx xxxxx  1407 1847   438
Potent Cap.: xxxx xxxx xxxxx   779 xxxx xxxxx  xxxx xxxx xxxxx   132   75   572
Move Cap.:   xxxx xxxx xxxxx   779 xxxx xxxxx  xxxx xxxx xxxxx   125   70   572
Volume/Cap:  xxxx xxxx  xxxx  0.07 xxxx  xxxx  xxxx xxxx  xxxx  0.22 0.00  0.08
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  243 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.2 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 26.2 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              26.2
ApproachLOS:        *                 *                 *                  D
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.379
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      39  620    38   114  666   130   129   77    37    33   59   109
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   39  620    38   114  666   130   129   77    37    33   59   109
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    39  620    38   114  666   130   129   77    37    33   59   109
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   39  620    38   114  666   130   129   77    37    33   59   109
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   109
RTOR Vol:      39  620    38   114  666   130   129   77    37    33   59     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   39  620    38   114  666   130   129   77    37    33   59     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.88  0.12  1.00 1.67  0.33  1.00 1.35  0.65  1.00 1.00  1.00
Final Sat.:  1650 3109   191  1650 2761   539  1650 2229  1071  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.20  0.20  0.07 0.24  0.24  0.08 0.03  0.03  0.02 0.04  0.00
Crit Volume:   39                          398   129                     59
Crit Moves:  ****                         ****  ****                   ****
******************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.458
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 42 Level Of Service: A

Street Name:	O'hara Ave.							Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound		
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected				
Rights:	Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2
Volume Module:															
Base Vol:	282	340		34		61	286		121		99	389		138	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	282	340		34		61	286		121		99	389		138	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	282	340		34		61	286		121		99	389		138	
Reduct Vol:	0	0		0		0	0		0		0	0		0	
Reduced Vol:	282	340		34		61	286		121		99	389		138	
RTOR Reduct:	0	0		34		0	0		99		0	0		138	
RTOR Vol:	282	340		0		61	286		22		99	389		0	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	282	340		0		61	286		22		99	389		0	
Saturation Flow Module:															
Sat/Lane:	1650	1650		1650		1650	1650		1650		1650	1650		1650	
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		0.91	
Lanes:	1.00	1.00		1.00		2.00	1.00		1.00		2.00	2.00		1.00	
Final Sat.:	1650	1650		1650		1650	3300		1650		1650	3300		3000	
Capacity Analysis Module:															
Vol/Sat:	0.17	0.21		0.00		0.04	0.09		0.01		0.06	0.12		0.00	
Crit Volume:	282						143				99				
Crit Moves:	****						****				****				

Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:															
Rights:															
Min. Green:															
Lanes:															
Volume Module:															
Base Vol:				58	464		60								
Growth Adj:				1.00	1.00		1.00								
Initial Bse:				58	464		60								
User Adj:				1.00	1.00		1.00								
PHF Adj:				1.00	1.00		1.00								
PHF Volume:				58	464		60								
Reduct Vol:				0	0		0								
Reduced Vol:				58	464		60								
RTOR Reduct:				0	0		60								
RTOR Vol:				58	464		0								
PCE Adj:				1.00	1.00		1.00								
MLF Adj:				1.00	1.00		1.00								
FinalVolume:				58	464		0								
Saturation Flow Module:															
Sat/Lane:				1650	1650		1650								
Adjustment:				1.00	1.00		1.00								
Lanes:				1.00	2.00		1.00								
Final Sat.:				1650	3300		1650								
Capacity Analysis Module:															
Vol/Sat:				0.04	0.14		0.00								
Crit Volume:					232										
Crit Moves:					****										

Scenario Report

Scenario:	EPAP AM
Command:	Default
Volume:	EPAP AM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12	632			0	0	723			6	3		0		8	0		0		0
ApproachDel:	xxxxxx					xxxxxx					17.8					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=11]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1384]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12	632			0	0	723			6	3		0		8	0		0		0

Major Street Volume: 1373
Minor Approach Volume: 11
Minor Approach Volume Threshold: 176

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	3	634		0	0	723		6	6		0	12	0		0	0
ApproachDel:	xxxxxx				xxxxxx				18.8				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=18]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1384]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	3	634		0	0	723		6	6		0	12	0		0	0

Major Street Volume: 1366
Minor Approach Volume: 18
Minor Approach Volume Threshold: 177

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	649		7	31	711		0	0	0		0	1	0		1
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				21.2			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=2]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1400]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	649		7	31	711		0	0	0		0	1	0		1

Major Street Volume: 1398
Minor Approach Volume: 2
Minor Approach Volume Threshold: 169

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	720		1	0	871		0	0		0	0	0		0	1
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				13.4			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=1]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1593]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	720		1	0	871		0	0		0	0	0		0	1

Major Street Volume: 1592
Minor Approach Volume: 1
Minor Approach Volume Threshold: 125

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	15		701		21	11		842		18	14		0		29	24		2		12
ApproachDel:	xxxxxx					xxxxxx					29.3					28.3				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=43]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1689]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=38]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1689]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	15		701		21	11		842		18	14		0		29	24		2		12

Major Street Volume: 1608
Minor Approach Volume: 43
Minor Approach Volume Threshold: 121

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	1	1 0	1	0	2	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	667		37	22	730		0	0		0	0	19		0	27
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				17.0			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=46]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1502]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	1	1 0	1	0	2	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	667		37	22	730		0	0		0	0	19		0	27

Major Street Volume: 1456
Minor Approach Volume: 46
Minor Approach Volume Threshold: 155

SIGNAL WARRANT DISCLAIMER

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Scenario Report

Scenario:	EPAP PM
Command:	Default
Volume:	EPAP PM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

****

Intersection #2 Brentwood Blvd. @ Sunrise Drive

****

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	15	859		0	0	878		15	20		0	12	0		0	0
ApproachDel:	xxxxxx				xxxxxx				43.3				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=32]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1799]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	15	859		0	0	878		15	20		0	12	0		0	0

Major Street Volume: 1767
Minor Approach Volume: 32
Minor Approach Volume Threshold: 89 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	11	854		0	0	880		5	9		0	8	0		0	0
ApproachDel:	xxxxxx				xxxxxx				33.7				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=17]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1767]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	11		854		0	0		880		5	9		0		8	0		0		0

Major Street Volume: 1750
Minor Approach Volume: 17
Minor Approach Volume Threshold: 92 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0		876		18	15		880		0	0		0		0	2		0		4
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					26.3				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1795]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	876		18	15	880		0	0		0	0	2		0	4

Major Street Volume: 1789
Minor Approach Volume: 6
Minor Approach Volume Threshold: 84 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	1	0 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	945		0	0	1059		0	0		0	0	0		0	1
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				16.3			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=1]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2005]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	1	0 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	945		0	0	1059		0	0		0	0	0		0	1

Major Street Volume: 2004
Minor Approach Volume: 1
Minor Approach Volume Threshold: 45 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 1	1	0	1	1 0	0	0	1!	0 0	0	0	1!	0 0
Initial Vol:	19	928		27	24	1015		20	7		1	14	12		0	9
ApproachDel:	xxxxxx				xxxxxx				52.9				37.8			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=22]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2076]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=21]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2076]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 1	1	0	1	1 0	0	0	1!	0 0	0	0	1!	0 0
Initial Vol:	19	928		27	24	1015		20	7		1	14	12		0	9

Major Street Volume: 2033
Minor Approach Volume: 22
Minor Approach Volume Threshold: 40 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	1	1 0	1	0	2	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	826		50	58	880		0	0		0	0	28		0	46
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				26.2			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=74]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1888]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0		826		50	58		880		0	0		0		0	28		0		46

Major Street Volume: 1814
Minor Approach Volume: 74
Minor Approach Volume Threshold: 80 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

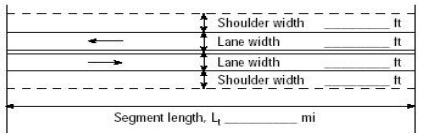
The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*AM Peak*	Analysis Year	*EPAP*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*715* veh/h
Directional split	*50 / 50*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*789*
v_p * highest directional split proportion[2] (pc/h)	*395*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.0*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*25.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*787*
v_p * highest directional split proportion[2] (pc/h)	*394*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*49.9*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*15.7*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*65.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.25*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*39*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*143*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*1.5*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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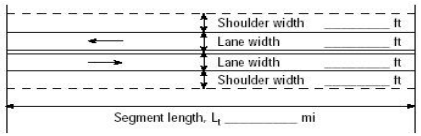
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*PM Peak*	Analysis Year	*EPAP*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*886* veh/h
Directional split	*52 / 48*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*978*
v_p * highest directional split proportion[2] (pc/h)	*509*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.6*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*24.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*976*
v_p * highest directional split proportion[2] (pc/h)	*508*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*57.6*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*13.1*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*70.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.31*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*49*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*177*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*2.0*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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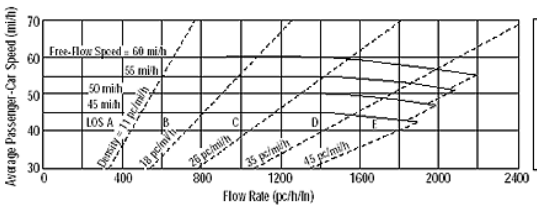
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	707	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	394
Speed, S (mi/h)	45.0
D (pc/mi/ln)	8.8
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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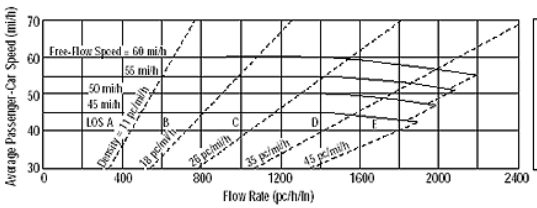
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	891	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	497
Speed, S (mi/h)	45.0
D (pc/mi/ln)	11.0+
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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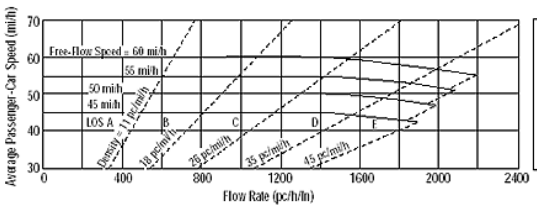
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	997	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	562
Speed, S (mi/h)	45.0
D (pc/mi/ln)	12.5
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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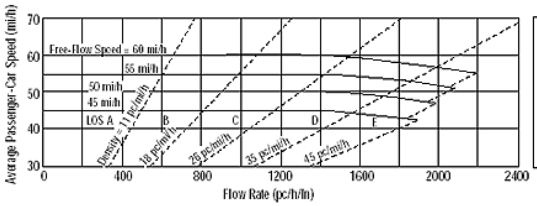
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1081	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	610
Speed, S (mi/h)	45.0
D (pc/mi/ln)	13.6
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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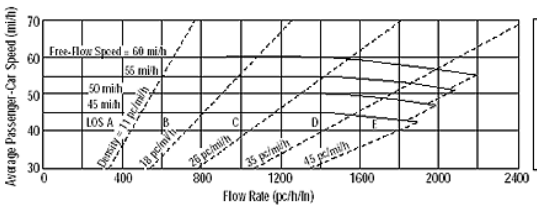
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	295	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	175
Speed, S (mi/h)	45.0
D (pc/mi/ln)	3.9
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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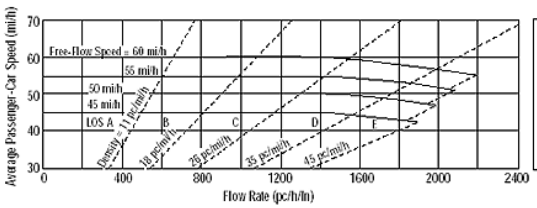
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	357	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	212
Speed, S (mi/h)	45.0
D (pc/mi/ln)	4.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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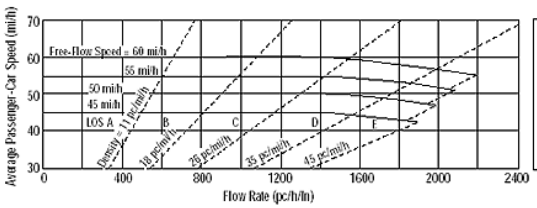
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	455	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	262
Speed, S (mi/h)	45.0
D (pc/mi/ln)	5.8
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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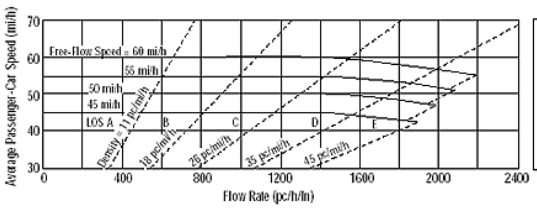
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	476	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	274
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.1
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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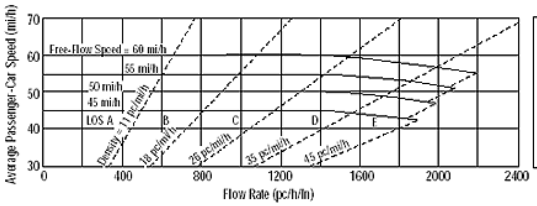
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	667	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	361
Speed, S (mi/h)	45.0
D (pc/mi/ln)	8.0
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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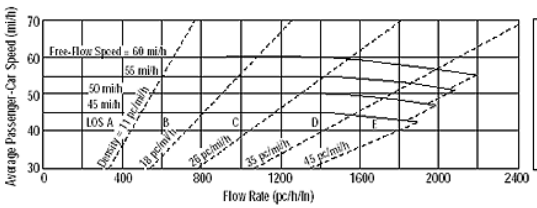
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	771	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	417
Speed, S (mi/h)	45.0
D (pc/mi/ln)	9.3
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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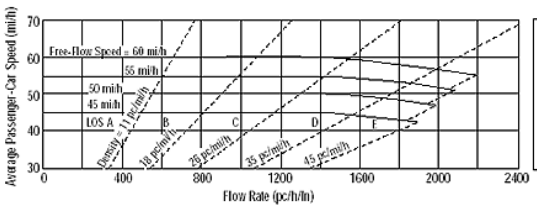
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	907	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	523
Speed, S (mi/h)	45.0
D (pc/mi/ln)	11.6
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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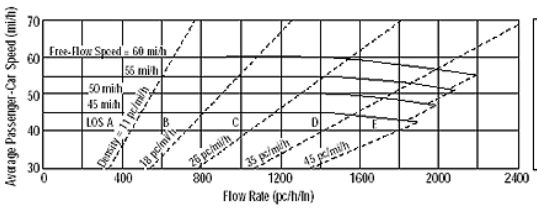
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	936	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	539
Speed, S (mi/h)	45.0
D (pc/mi/ln)	12.0
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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Appendix D:

Analysis Worksheets for
Existing plus Approved Projects plus Proposed Project Conditions

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
******************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.498
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        45                 Level Of Service:                   A
******************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     322  448   15     4  609  109    97    6  424    32    6    4
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  322  448   15     4  609  109    97    6  424    32    6    4
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   322  448   15     4  609  109    97    6  424    32    6    4
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  322  448   15     4  609  109    97    6  424    32    6    4
RTOR Reduct:    0    0   15     0    0    0     0    0  322     0    0    4
RTOR Vol:     322  448    0     4  609  109    97    6  102    32    6    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  322  448    0     4  609  109    97    6  102    32    6    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.00 1.00  1.00 1.70 0.30  0.94 0.06 1.00  0.84 0.16 1.00
Final Sat.:  1650 1650 1650  1650 2799  501  1554   96 1650  1389  261 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.27 0.00  0.00 0.22 0.22  0.06 0.06 0.06  0.02 0.02 0.00
Crit Volume:  322                       359        103               38
Crit Moves:  ****                      ****       ****             ****
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: C[ 18.3]
******************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      12  794     0     0 1059     6     3    0     8     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   12  794     0     0 1059     6     3    0     8     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    12  794     0     0 1059     6     3    0     8     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   12  794     0     0 1059     6     3    0     8     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1065 xxxx xxxxx  xxxx xxxx xxxxx  1880 1880  1062  xxxx xxxx xxxxx
Potent Cap.:  662 xxxx xxxxx  xxxx xxxx xxxxx    79   72   274  xxxx xxxx xxxxx
Move Cap.:    662 xxxx xxxxx  xxxx xxxx xxxxx    78   71   274  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   303  273 xxxxx   233  265 xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.03  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 10.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  281 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 18.3 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             18.3           xxxxxx
ApproachLOS:        *                *                C                *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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--------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: C[ 18.5]
********************************************************************************
Street Name:         Brentwood Blvd.                     Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       3  796     0     0 1059     6     6    0    12     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    3  796     0     0 1059     6     6    0    12     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     3  796     0     0 1059     6     6    0    12     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    3  796     0     0 1059     6     6    0    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1065 xxxx xxxxx  xxxx xxxx xxxxx  1864 1864  1062  xxxx xxxx xxxxx
Potent Cap.:  662 xxxx xxxxx  xxxx xxxx xxxxx    81   74   274  xxxx xxxx xxxxx
Move Cap.:    662 xxxx xxxxx  xxxx xxxx xxxxx    81   73   274  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   306  276 xxxxx   237  273 xxxxx
Volume/Cap:  0.00 xxxx  xxxx  xxxx xxxx  xxxx  0.02 0.00  0.04  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 10.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  284 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.2 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 18.5 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx             18.5            xxxxxx
ApproachLOS:        *                 *                C               *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: E[ 35.1]
********************************************************************************
Street Name:         Brentwood Blvd.                     Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  811     7    31 1047     0     0    0     0     1    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  811     7    31 1047     0     0    0     0     1    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  811     7    31 1047     0     0    0     0     1    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  811     7    31 1047     0     0    0     0     1    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   818 xxxx xxxxx  xxxx xxxx xxxxx  1924 1924   815
Potent Cap.: xxxx xxxx xxxxx   819 xxxx xxxxx  xxxx xxxx xxxxx    74   68   381
Move Cap.:   xxxx xxxx xxxxx   819 xxxx xxxxx  xxxx xxxx xxxxx    72   65   381
Volume/Cap:  xxxx xxxx  xxxx  0.04 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   9.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  121 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 35.1 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    E     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              35.1
ApproachLOS:        *                 *                 *                  E
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.867
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       171                 Level Of Service:                   D
********************************************************************************
Street Name:         Brentwood Blvd.              Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10   10     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      86  566   226   152  831    60   101   42   149   218   44   149
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   86  566   226   152  831    60   101   42   149   218   44   149
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    86  566   226   152  831    60   101   42   149   218   44   149
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   86  566   226   152  831    60   101   42   149   218   44   149
RTOR Reduct:    0    0   218     0    0     0     0    0     0     0    0   149
RTOR Vol:      86  566     8   152  831    60   101   42   149   218   44     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   86  566     8   152  831    60   101   42   149   218   44     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 0.93  0.07  1.00 0.22  0.78  0.83 0.17  1.00
Final Sat.:  1650 1650  1650  1650 1539   111  1650  363  1287  1373  277  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.34  0.00  0.09 0.54  0.54  0.06 0.12  0.12  0.16 0.16  0.00
Crit Volume:   86                         891              191        262
Crit Moves:  ****                         ****             ****       ****
********************************************************************************
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--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: C[ 15.4]
********************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  882     1     0 1207     0     0    0     0     0    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  882     1     0 1207     0     0    0     0     0    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  882     1     0 1207     0     0    0     0     0    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  882     1     0 1207     0     0    0     0     0    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   883
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   348
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   348
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.0
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  15.4
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              15.4
ApproachLOS:        *                *                *                  C
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      1.3       Worst Case Level Of Service: F[ 53.4]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  863    21    11 1178    18     0    0    43    24    2    12
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   15  863    21    11 1178    18     0    0    43    24    2    12
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    15  863    21    11 1178    18     0    0    43    24    2    12
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   15  863    21    11 1178    18     0    0    43    24    2    12
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1196 xxxx xxxxx   884 xxxx xxxxx  xxxx xxxx   598  1504 2111   863
Potent Cap.:  591 xxxx xxxxx   774 xxxx xxxxx  xxxx xxxx   506   101   52   357
Move Cap.:    591 xxxx xxxxx   774 xxxx xxxxx  xxxx xxxx   506    89   50   357
Volume/Cap:  0.03 xxxx  xxxx  0.01 xxxx  xxxx  xxxx xxxx  0.08  0.27 0.04  0.03
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx   0.3  xxxx xxxx xxxxx
Control Del: 11.3 xxxx xxxxx   9.7 xxxx xxxxx xxxxx xxxx  12.8 xxxxx xxxx xxxxx
LOS by Move:   B    *     *     A    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  111 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.4 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 53.4 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx              12.8              53.4
ApproachLOS:        *                 *                 B                 F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.393
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        31                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                  Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  863    14     2 1213    10    23    0    21    28    0    10
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   15  863    14     2 1213    10    23    0    21    28    0    10
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    15  863    14     2 1213    10    23    0    21    28    0    10
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   15  863    14     2 1213    10    23    0    21    28    0    10
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     2
RTOR Vol:      15  863    14     2 1213    10    23    0    21    28    0     8
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   15  863    14     2 1213    10    23    0    21    28    0     8
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.97  0.03  1.00 1.98  0.02  1.00 0.00  1.00  1.00 0.00  1.00
Final Sat.:  1720 3385    55  1720 3412    28  1720    0  1720  1720    0  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.25  0.25  0.00 0.36  0.36  0.01 0.00  0.01  0.02 0.00  0.00
Crit Volume:   15                     612                      21    28
Crit Moves:  ****                    ****                    ****  ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.622
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 49 Level Of Service: B

Street Name:	Brentwood Blvd.						Sand Creek Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	4 10 10			4 10 10			4 4 4			4 4 4		
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	166	540	250	304	717	206	191	179	136	120	86	137
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	166	540	250	304	717	206	191	179	136	120	86	137
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	166	540	250	304	717	206	191	179	136	120	86	137
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	166	540	250	304	717	206	191	179	136	120	86	137
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	166	540	250	304	717	206	191	179	136	120	86	137
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	166	540	250	304	717	206	191	179	136	120	86	137
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.37	0.63	1.00	1.55	0.45	1.00	1.14	0.86	1.00	1.00	1.00
Final Sat.:	1650	2256	1044	1650	2563	737	1650	1875	1425	1650	1650	1650
Capacity Analysis Module:												
Vol/Sat:	0.10	0.24	0.24	0.18	0.28	0.28	0.12	0.10	0.10	0.07	0.05	0.08
Crit Volume:	395			304			191					137
Crit Moves:	****			****			****					****

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.405
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 38 Level Of Service: A

Street Name:	Brentwood Blvd.						Technology Way					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	4 6 6			0 6 6			4 4 4			4 4 4		
Lanes:	1 0 1 1 0			1 0 1 1 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	41	916	44	82	851	43	18	0	28	21	0	39
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	41	916	44	82	851	43	18	0	28	21	0	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	41	916	44	82	851	43	18	0	28	21	0	39
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	41	916	44	82	851	43	18	0	28	21	0	39
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	41	916	44	82	851	43	18	0	28	21	0	39
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	41	916	44	82	851	43	18	0	28	21	0	39
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.91	0.09	1.00	1.90	0.10	0.39	0.00	0.61	0.35	0.00	0.65
Final Sat.:	1650	3149	151	1650	3141	159	646	0	1004	578	0	1073
Capacity Analysis Module:												
Vol/Sat:	0.02	0.29	0.29	0.05	0.27	0.27	0.03	0.00	0.03	0.04	0.00	0.04
Crit Volume:	480			82			46			60		
Crit Moves:	****			****			****			****		

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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
******************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: D[ 25.9]
******************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  961    37    22  871     0     0     0     0    19     0    27
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  961    37    22  871     0     0     0     0    19     0    27
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  961    37    22  871     0     0     0     0    19     0    27
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0  961    37    22  871     0     0     0     0    19     0    27
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   998 xxxx xxxxx  xxxx xxxx xxxxx  1459 1895   499
Potent Cap.: xxxx xxxx xxxxx   701 xxxx xxxxx  xxxx xxxx xxxxx   122   71   522
Move Cap.:   xxxx xxxx xxxxx   701 xxxx xxxxx  xxxx xxxx xxxxx   119   68   522
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.16 0.00  0.05
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  218 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.8 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 25.9 xxxxx
Shared LOS:    *    *     *     *    *     *     *     *     *     *     D     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              25.9
ApproachLOS:        *                 *                 *                  D
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.404
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      34  729    39    65  691   121   143   55    34    40   84   124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   34  729    39    65  691   121   143   55    34    40   84   124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    34  729    39    65  691   121   143   55    34    40   84   124
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   34  729    39    65  691   121   143   55    34    40   84   124
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    65
RTOR Vol:      34  729    39    65  691   121   143   55    34    40   84    59
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   34  729    39    65  691   121   143   55    34    40   84    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.90  0.10  1.00 1.70  0.30  1.00 1.24  0.76  1.00 1.00  1.00
Final Sat.:  1650 3132   168  1650 2808   492  1650 2039  1261  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.23  0.23  0.04 0.25  0.25  0.09 0.03  0.03  0.02 0.05  0.04
Crit Volume:   34                    406         143                     84
Crit Moves:  ****                 ****        ****                    ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.368
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 36 Level Of Service: A

Street Name:	O'hara Ave.							Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound		
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected				
Rights:	Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2
Volume Module:															
Base Vol:	113	208		31		48	321		124		163	517		289	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	113	208		31		48	321		124		163	517		289	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	113	208		31		48	321		124		163	517		289	
Reduct Vol:	0	0		0		0	0		0		0	0		0	
Reduced Vol:	113	208		31		48	321		124		163	517		289	
RTOR Reduct:	0	0		31		0	0		124		0	0		113	
RTOR Vol:	113	208		0		48	321		0		163	517		176	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	113	208		0		48	321		0		163	517		176	
Saturation Flow Module:															
Sat/Lane:	1650	1650		1650		1650	1650		1650		1650	1650		1650	
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		0.91	
Lanes:	1.00	1.00		1.00		2.00	1.00		1.00		2.00	2.00		1.00	
Final Sat.:	1650	1650		1650		1650	3300		1650		1650	3300		3000	
Capacity Analysis Module:															
Vol/Sat:	0.07	0.13		0.00		0.03	0.10		0.00		0.10	0.16		0.06	
Crit Volume:		208				48					163				
Crit Moves:		****				****					****				

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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
******************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.603
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        57                 Level Of Service:                   B
******************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     468  710   16     9  627  102   111   22  429    19   10    9
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  468  710   16     9  627  102   111   22  429    19   10    9
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   468  710   16     9  627  102   111   22  429    19   10    9
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  468  710   16     9  627  102   111   22  429    19   10    9
RTOR Reduct:    0    0   16     0    0    0     0    0  429     0    0    9
RTOR Vol:     468  710    0     9  627  102   111   22    0    19   10    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  468  710    0     9  627  102   111   22    0    19   10    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.00 1.00  1.00 1.72 0.28  0.83 0.17 1.00  0.66 0.34 1.00
Final Sat.:  1650 1650 1650  1650 2838  462  1377  273 1650  1081  569 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.28 0.43 0.00  0.01 0.22 0.22  0.08 0.08 0.00  0.02 0.02 0.00
Crit Volume:  468                 365              133               29
Crit Moves:  ****              ****             ****             ****
******************************************************************************
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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.4       Worst Case Level Of Service: C[ 21.4]
******************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15 1177     0     0 1072    15    20    0    12     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   15 1177     0     0 1072    15    20    0    12     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    15 1177     0     0 1072    15    20    0    12     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   15 1177     0     0 1072    15    20    0    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1087 xxxx xxxxx  xxxx xxxx xxxxx  2287 2287  1080  xxxx xxxx xxxxx
Potent Cap.:  649 xxxx xxxxx  xxxx xxxx xxxxx    44   40   268  xxxx xxxx xxxxx
Move Cap.:    649 xxxx xxxxx  xxxx xxxx xxxxx    43   39   268  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   242  219 xxxxx   184  214 xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.08 0.00  0.04  xxxx xxxx  xxxx
------------||---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 10.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  251 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.4 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 21.4 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             21.4           xxxxxx
ApproachLOS:        *                *               C                *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: C[ 20.0]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      11 1172     0     0 1074     5     9     0     8     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   11 1172     0     0 1074     5     9     0     8     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    11 1172     0     0 1074     5     9     0     8     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   11 1172     0     0 1074     5     9     0     8     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1079 xxxx xxxxx  xxxx xxxx xxxxx  2271 2271  1077  xxxx xxxx xxxxx
Potent Cap.:  654 xxxx xxxxx  xxxx xxxx xxxxx    45   41   269  xxxx xxxx xxxxx
Move Cap.:    654 xxxx xxxxx  xxxx xxxx xxxxx    44   40   269  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   246  222 xxxxx   189  219 xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.04 0.00  0.03  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 10.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  256 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.2 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 20.0 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx              20.0            xxxxxx
ApproachLOS:        *                 *                 C               *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: E[ 47.0]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1194    18    15 1074     0     0     0     0     2     0     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1194    18    15 1074     0     0     0     0     2     0     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0 1194    18    15 1074     0     0     0     0     2     0     4
Reduct Vol:    0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   0 1194    18    15 1074     0     0     0     0     2     0     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1212 xxxx xxxxx  xxxx xxxx xxxxx  2307 2307  1203
Potent Cap.: xxxx xxxx xxxxx   583 xxxx xxxxx  xxxx xxxx xxxxx    43   39   227
Move Cap.:   xxxx xxxx xxxxx   583 xxxx xxxxx  xxxx xxxx xxxxx    42   38   227
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.05 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   92 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.2 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 47.0 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    E     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              47.0
ApproachLOS:        *                 *                 *                 E
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.975
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 Level Of Service:                   E
********************************************************************************
Street Name:         Brentwood Blvd.             Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10   10     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     121  904   238   178  795    89    61   43   101   329   53   245
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  121  904   238   178  795    89    61   43   101   329   53   245
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   121  904   238   178  795    89    61   43   101   329   53   245
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  121  904   238   178  795    89    61   43   101   329   53   245
RTOR Reduct:    0    0   238     0    0     0     0    0     0     0    0   178
RTOR Vol:     121  904     0   178  795    89    61   43   101   329   53    67
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  121  904     0   178  795    89    61   43   101   329   53    67
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 0.90  0.10  1.00 0.30  0.70  0.86 0.14  1.00
Final Sat.:  1650 1650  1650  1650 1484   166  1650  493  1157  1421  229  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.55  0.00  0.11 0.54  0.54  0.04 0.09  0.09  0.23 0.23  0.04
Crit Volume:       904         178                   144              382
Crit Moves:       ****       ****                  ****             ****
********************************************************************************
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                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: C[ 22.3]
********************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1263     0     0 1253     0     0    0     0     0    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1263     0     0 1253     0     0    0     0     0    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1263     0     0 1253     0     0    0     0     0    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1263     0     0 1253     0     0    0     0     0    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  1263
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   209
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   209
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.0
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  22.3
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              22.3
ApproachLOS:        *                *                *                  C
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      0.9       Worst Case Level Of Service: F[ 79.7]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      19 1246    27    24 1209    20     0    0    22    12    0     9
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   19 1246    27    24 1209    20     0    0    22    12    0     9
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    19 1246    27    24 1209    20     0    0    22    12    0     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   19 1246    27    24 1209    20     0    0    22    12    0     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1229 xxxx xxxxx  1273 xxxx xxxxx  xxxx xxxx   615  1937 2561  1246
Potent Cap.:  574 xxxx xxxxx   552 xxxx xxxxx  xxxx xxxx   495    50   27   214
Move Cap.:    574 xxxx xxxxx   552 xxxx xxxxx  xxxx xxxx   495    45   25   214
Volume/Cap:  0.03 xxxx  xxxx  0.04 xxxx  xxxx  xxxx xxxx  0.04  0.27 0.00  0.04
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx   0.1  xxxx xxxx xxxxx
Control Del: 11.5 xxxx xxxxx  11.8 xxxx xxxxx xxxxx xxxx  12.6 xxxxx xxxx xxxxx
LOS by Move:   B    *     *     B    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   68 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 79.7 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx              12.6              79.7
ApproachLOS:        *                 *                 B                 F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.421
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        32                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                  Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21 1289    31    10 1199    14     2    0    23    31    1     7
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21 1289    31    10 1199    14     2    0    23    31    1     7
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21 1289    31    10 1199    14     2    0    23    31    1     7
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21 1289    31    10 1199    14     2    0    23    31    1     7
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     7
RTOR Vol:      21 1289    31    10 1199    14     2    0    23    31    1     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   21 1289    31    10 1199    14     2    0    23    31    1     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.95  0.05  1.00 1.98  0.02  1.00 0.00  1.00  0.97 0.03  1.00
Final Sat.:  1720 3359    81  1720 3400    40  1720    0  1720  1666   54  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.38  0.38  0.01 0.35  0.35  0.00 0.00  0.01  0.02 0.02  0.00
Crit Volume:       660          10                          23    31
Crit Moves:       ****        ****                        ****  ****
******************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.802
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 94 Level Of Service: D

Street Name:	Brentwood Blvd.						Sand Creek Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	4 10 10			4 10 10			4 4 4			4 4 4		
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	223 743	163	223 769	283	283 103	190	262 169	292				
Growth Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
Initial Bse:	223 743	163	223 769	283	283 103	190	262 169	292				
User Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
PHF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
PHF Volume:	223 743	163	223 769	283	283 103	190	262 169	292				
Reduct Vol:	0 0	0	0 0	0	0 0	0	0 0	0				
Reduced Vol:	223 743	163	223 769	283	283 103	190	262 169	292				
RTOR Reduct:	0 0	0	0 0	0	0 0	0	0 0	0				
RTOR Vol:	223 743	163	223 769	283	283 103	190	262 169	292				
PCE Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
MLF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
FinalVolume:	223 743	163	223 769	283	283 103	190	262 169	292				
Saturation Flow Module:												
Sat/Lane:	1650 1650	1650	1650 1650	1650	1650 1650	1650	1650 1650	1650				
Adjustment:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
Lanes:	1.00 1.64	0.36	1.00 1.46	0.54	1.00 1.00	1.00	1.00 1.00	1.00				
Final Sat.:	1650 2706	594	1650 2412	888	1650 1650	1650	1650 1650	1650				
Capacity Analysis Module:												
Vol/Sat:	0.14 0.27	0.27	0.14 0.32	0.32	0.17 0.06	0.12	0.16 0.10	0.18				
Crit Volume:	223			526	283			292				
Crit Moves:	****			****	****			****				

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.536
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 49 Level Of Service: A

Street Name:	Brentwood Blvd.						Technology Way					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	4 6 6			0 6 6			4 4 4			4 4 4		
Lanes:	1 0 1 1 0			1 0 1 1 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	39 971	54	82 1132	20	41 0	39	81 0	109				
Growth Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
Initial Bse:	39 971	54	82 1132	20	41 0	39	81 0	109				
User Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
PHF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
PHF Volume:	39 971	54	82 1132	20	41 0	39	81 0	109				
Reduct Vol:	0 0	0	0 0	0	0 0	0	0 0	0				
Reduced Vol:	39 971	54	82 1132	20	41 0	39	81 0	109				
RTOR Reduct:	0 0	0	0 0	0	0 0	0	0 0	0				
RTOR Vol:	39 971	54	82 1132	20	41 0	39	81 0	109				
PCE Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
MLF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
FinalVolume:	39 971	54	82 1132	20	41 0	39	81 0	109				
Saturation Flow Module:												
Sat/Lane:	1650 1650	1650	1650 1650	1650	1650 1650	1650	1650 1650	1650				
Adjustment:	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00	1.00 1.00	1.00				
Lanes:	1.00 1.89	0.11	1.00 1.97	0.03	0.51 0.00	0.49	0.43 0.00	0.57				
Final Sat.:	1650 3126	174	1650 3243	57	846 0	804	703 0	947				
Capacity Analysis Module:												
Vol/Sat:	0.02 0.31	0.31	0.05 0.35	0.35	0.05 0.00	0.05	0.12 0.00	0.12				
Crit Volume:	39			576		80		190				
Crit Moves:	****			****		****		****				

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
******************************************************************************
Average Delay (sec/veh):      1.7       Worst Case Level Of Service: E[ 44.2]
******************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  995    50    58 1159     0     0     0     0    28     0    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  995    50    58 1159     0     0     0     0    28     0    46
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  995    50    58 1159     0     0     0     0    28     0    46
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0  995    50    58 1159     0     0     0     0    28     0    46
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1045 xxxx xxxxx  xxxx xxxx xxxxx  1716 2295   523
Potent Cap.: xxxx xxxx xxxxx   673 xxxx xxxxx  xxxx xxxx xxxxx    83   39   504
Move Cap.:   xxxx xxxx xxxxx   673 xxxx xxxxx  xxxx xxxx xxxxx    77   36   504
Volume/Cap:  xxxx xxxx  xxxx  0.09 xxxx  xxxx  xxxx xxxx  xxxx  0.36 0.00  0.09
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  163 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  2.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 44.2 xxxxx
Shared LOS:    *    *     *     *    *     *     *     *     *     *     E     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              44.2
ApproachLOS:        *                 *                 *                  E
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.478
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15   15     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      39  765   38   114  905  170   153   77   37    33   59  109
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   39  765   38   114  905  170   153   77   37    33   59  109
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    39  765   38   114  905  170   153   77   37    33   59  109
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   39  765   38   114  905  170   153   77   37    33   59  109
RTOR Reduct:    0    0    0     0    0    0     0    0    0     0    0  109
RTOR Vol:      39  765   38   114  905  170   153   77   37    33   59    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   39  765   38   114  905  170   153   77   37    33   59    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.91 0.09  1.00 1.68 0.32  1.00 1.35 0.65  1.00 1.00 1.00
Final Sat.:  1650 3144  156  1650 2778  522  1650 2229 1071  1650 1650 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.24 0.24  0.07 0.33 0.33  0.09 0.03 0.03  0.02 0.04 0.00
Crit Volume:   39                    538          153                    59
Crit Moves:  ****                 ****         ****                 ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.518
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 47 Level Of Service: A

Street Name:	O'hara Ave.							Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound		
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected				
Rights:	Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2
Volume Module:															
Base Vol:	282	340		34		61	286		121		99	510		138	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	282	340		34		61	286		121		99	510		138	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	282	340		34		61	286		121		99	510		138	
Reduct Vol:	0	0		0		0	0		0		0	0		0	
Reduced Vol:	282	340		34		61	286		121		99	510		138	
RTOR Reduct:	0	0		34		0	0		99		0	0		138	
RTOR Vol:	282	340		0		61	286		22		99	510		0	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	282	340		0		61	286		22		99	510		0	
Saturation Flow Module:															
Sat/Lane:	1650	1650		1650		1650	1650		1650		1650	1650		1650	
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		0.91	
Lanes:	1.00	1.00		1.00		2.00	1.00		1.00		2.00	2.00		1.00	
Final Sat.:	1650	1650		1650		1650	3300		1650		1650	3300		3000	
Capacity Analysis Module:															
Vol/Sat:	0.17	0.21		0.00		0.04	0.09		0.01		0.06	0.15		0.00	
Crit Volume:	282						143				99				
Crit Moves:	****						****				****				

Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Base Vol:						61	286		121		99	510		138	
Growth Adj:						1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:						61	286		121		99	510		138	
User Adj:						1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:						1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:						61	286		121		99	510		138	
Reduct Vol:						0	0		0		0	0		0	
Reduced Vol:						61	286		121		99	510		138	
RTOR Reduct:						0	0		99		0	0		138	
RTOR Vol:						61	286		22		99	510		0	
PCE Adj:						1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:						1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:						61	286		22		99	510		0	
Saturation Flow Module:															
Sat/Lane:						1650	1650		1650		1650	1650		1650	
Adjustment:						1.00	1.00		1.00		1.00	1.00		0.91	
Lanes:						1.00	2.00		1.00		2.00	2.00		1.00	
Final Sat.:						1650	3300		1650		1650	3300		3000	
Capacity Analysis Module:															
Vol/Sat:						0.04	0.09		0.01		0.06	0.15		0.00	
Crit Volume:							143				99				
Crit Moves:							****				****				

Scenario Report

Scenario:	EPAP + PP AM
Command:	Default
Volume:	EPAP + PP AM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12		794		0	0		1059		6	3		0		8	0		0		0
ApproachDel:	xxxxxx					xxxxxx					28.7					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=11]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1882]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12		794		0	0		1059		6	3		0		8	0		0		0

Major Street Volume: 1871
Minor Approach Volume: 11
Minor Approach Volume Threshold: 69 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
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Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	3	796		0	0	1059		6	6		0	12	0		0	0
ApproachDel:	xxxxxx				xxxxxx				31.8				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=18]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1882]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	3	796		0	0	1059		6	6		0	12	0		0	0

Major Street Volume: 1864
Minor Approach Volume: 18
Minor Approach Volume Threshold: 70 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0	811			7	31	1047			0	0		0		0	1		0		1
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					35.1				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=2]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1898]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0	811			7	31	1047			0	0		0		0	1		0		1

Major Street Volume: 1896
Minor Approach Volume: 2
Minor Approach Volume Threshold: 64 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Initial Vol:	0	882			1	0	1207			0	0		0		0	0		0		1
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					15.4				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=1]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2091]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Initial Vol:	0	882			1	0	1207			0	0		0		0	0		0		1

Major Street Volume: 2090
Minor Approach Volume: 1
Minor Approach Volume Threshold: 31 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	15	863			21	11	1178			18	14		0		29	24		2		12
ApproachDel:	xxxxxx					xxxxxx					75.7					51.8				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.9]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=43]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2187]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=38]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2187]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	15	863			21	11	1178			18	14		0		29	24		2		12

Major Street Volume: 2106
Minor Approach Volume: 43
Minor Approach Volume Threshold: 28 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  961    37    22  871     0     0     0     0    19    0    27
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             25.9
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=46]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1937]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                  Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  961    37    22  871     0     0     0     0    19    0    27
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1891
Minor Approach Volume:           46
Minor Approach Volume Threshold: 65 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Scenario Report

Scenario:	EPAP + PP PM
Command:	Default
Volume:	EPAP + PP PM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

****

Intersection #2 Brentwood Blvd. @ Sunrise Drive

****

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	15	1177			0		0	1072		15	20			0	12		0		0	0
ApproachDel:	xxxxxx					xxxxxx					110.4					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=32]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2311]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	15	1177			0		0	1072		15	20		0		12	0		0		0

Major Street Volume: 2279
Minor Approach Volume: 32
Minor Approach Volume Threshold: 1 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	11	1172			0		0	1074		5	9		0		8	0		0		0
ApproachDel:	xxxxxx					xxxxxx					68.4					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=17]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2279]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	11	1172		0	0	1074		5	9		0	8	0		0	0

Major Street Volume: 2262
Minor Approach Volume: 17
Minor Approach Volume Threshold: 4 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Delay Signal Warrant Report

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	1194		18	15	1074		0	0		0	0	2		0	4
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				47.0			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2307]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0	1194		18		15	1074		0		0		0		0	2		0		4

Major Street Volume: 2301
Minor Approach Volume: 6
Minor Approach Volume Threshold: -2 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Initial Vol:	0	1263		0		0	1253		0		0		0		0	0		0		1
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					22.3				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=1]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2517]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	1	0 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	1263		0	0	1253		0	0		0	0	0		0	1

Major Street Volume: 2516
Minor Approach Volume: 1
Minor Approach Volume Threshold: -33 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 1	1	0	1	1 0	0	0	1!	0 0	0	0	1!	0 0
Initial Vol:	19	1246		27	24	1209		20	7		1	14	12		0	9
ApproachDel:	xxxxxx				xxxxxx				154.8				81.1			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.9]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=22]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2588]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=21]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2588]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	19	1246			27	24	1209			20	7		1		14	12		0		9

Major Street Volume: 2545
Minor Approach Volume: 22
Minor Approach Volume Threshold: -37 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Delay Signal Warrant Report

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0	995			50	58	1159			0	0		0		0	28		0		46
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					44.2				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.9]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=74]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2336]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0		995		50	58		1159		0	0		0		0	28		0		46

Major Street Volume: 2262
Minor Approach Volume: 74
Minor Approach Volume Threshold: 4 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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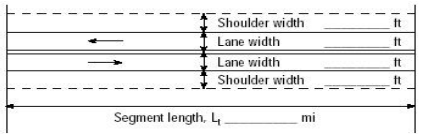
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*AM Peak*	Analysis Year	*EPAP plus Project*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*964* veh/h
Directional split	*55 / 45*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1064*
v_p * highest directional split proportion[2] (pc/h)	*585*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.4*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*24.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1061*
v_p * highest directional split proportion[2] (pc/h)	*584*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*60.6*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*11.9*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*72.5*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.33*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*53*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*193*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*2.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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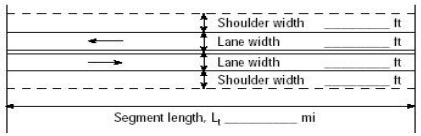
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*PM Peak*	Analysis Year	*EPAP plus Project*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1142* veh/h
Directional split	*51 / 49*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1257*
v_p * highest directional split proportion[2] (pc/h)	*641*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.0*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*23.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1255*
v_p * highest directional split proportion[2] (pc/h)	*640*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*66.8*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*9.7*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*76.5*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.39*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*63*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*228*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*2.7*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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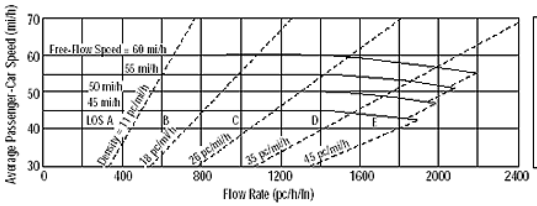
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	869	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	485
Speed, S (mi/h)	45.0
D (pc/mi/ln)	10.8
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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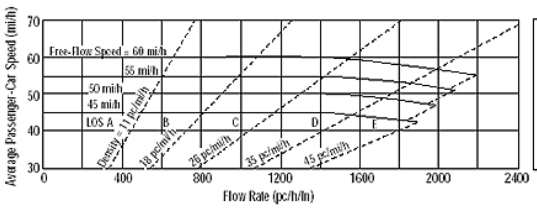
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1227	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	685
Speed, S (mi/h)	45.0
D (pc/mi/ln)	15.2
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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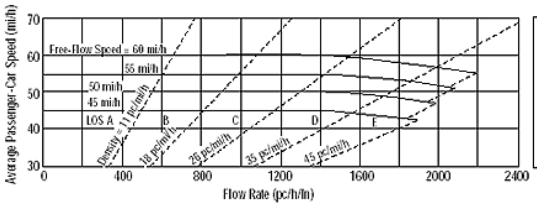
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + PP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1317	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	743
Speed, S (mi/h)	45.0
D (pc/mi/ln)	16.5
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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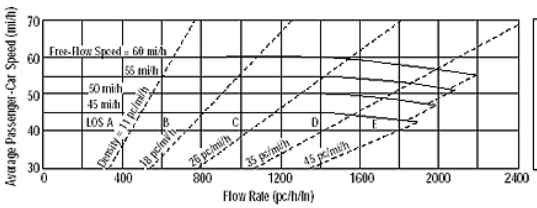
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + PP

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1275	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	719
Speed, S (mi/h)	45.0
D (pc/mi/ln)	16.0
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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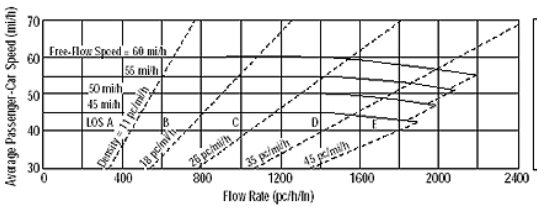
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	505	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	301
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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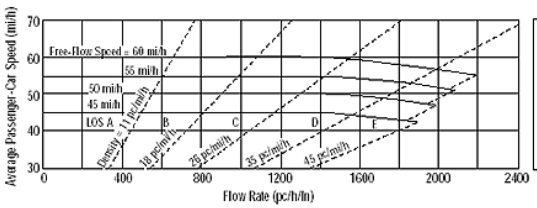
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	458	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	273
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.1
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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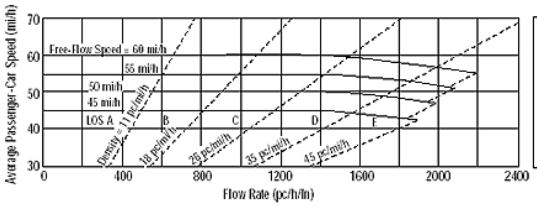
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	576	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	332
Speed, S (mi/h)	45.0
D (pc/mi/ln)	7.4
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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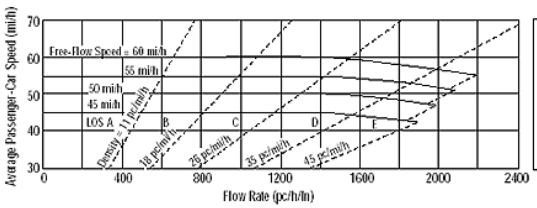
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	675	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	389
Speed, S (mi/h)	45.0
D (pc/mi/ln)	8.6
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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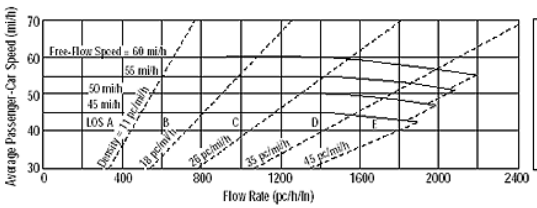
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	961	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	520
Speed, S (mi/h)	45.0
D (pc/mi/ln)	11.6
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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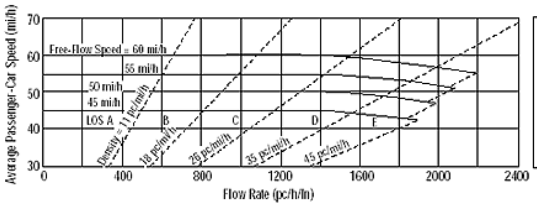
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	912	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	493
Speed, S (mi/h)	45.0
D (pc/mi/ln)	11.0-
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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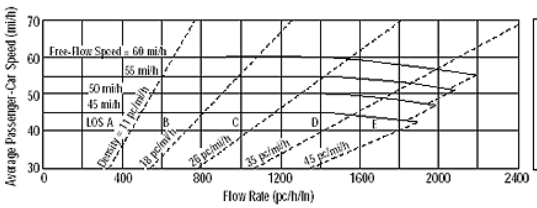
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1076	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	620
Speed, S (mi/h)	45.0
D (pc/mi/ln)	13.8
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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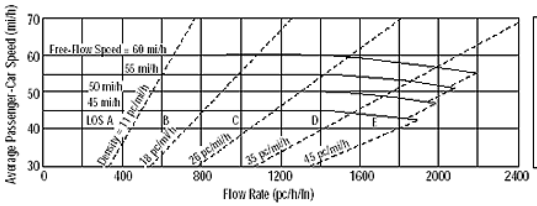
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	EPAP + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1216	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	701
Speed, S (mi/h)	45.0
D (pc/mi/ln)	15.6
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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Appendix E:

Analysis Worksheets for Cumulative Conditions

```
----------------------------------------------------------------------------
----------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
****************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
****************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.824
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       130                Level Of Service:                   D
****************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     555  461   77    41  441  322   325   49  468    32   17   14
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  555  461   77    41  441  322   325   49  468    32   17   14
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   555  461   77    41  441  322   325   49  468    32   17   14
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  555  461   77    41  441  322   325   49  468    32   17   14
RTOR Reduct:    0    0   32     0    0    0     0    0  468     0    0   14
RTOR Vol:     555  461   45    41  441  322   325   49    0    32   17    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  555  461   45    41  441  322   325   49    0    32   17    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.00 1.00  1.00 1.16 0.84  0.87 0.13 1.00  0.65 0.35 1.00
Final Sat.:  1650 1650 1650  1650 1907 1393  1434  216 1650  1078  572 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.34 0.28 0.03  0.02 0.23 0.23  0.23 0.23 0.00  0.03 0.03 0.00
Crit Volume:  555                         382        374               49
Crit Moves:  ****                        ****       ****             ****
****************************************************************************
```



```
----------------------------------------------------------------------------
----------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
****************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
****************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: C[ 17.1]
****************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      12 1080     0     0  832    10    14    0    17     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   12 1080     0     0  832    10    14    0    17     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    12 1080     0     0  832    10    14    0    17     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   12 1080     0     0  832    10    14    0    17     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  842 xxxx xxxxx  xxxx xxxx xxxxx  1941 1941   837  xxxx xxxx xxxxx
Potent Cap.:  802 xxxx xxxxx  xxxx xxxx xxxxx    73   66   370  xxxx xxxx xxxxx
Move Cap.:    802 xxxx xxxxx  xxxx xxxx xxxxx    72   65   370  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   289  260 xxxxx   229  258 xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.05 0.00  0.05  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  328 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 17.1 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             17.1           xxxxxx
ApproachLOS:        *                *               C                *
****************************************************************************
Note: Queue reported is the number of cars per lane.
****************************************************************************
```

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: C[ 17.1]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10 1082     0     0  834     8    14     0    17     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10 1082     0     0  834     8    14     0    17     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10 1082     0     0  834     8    14     0    17     0    0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0    0     0
FinalVolume:   10 1082     0     0  834     8    14     0    17     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  842 xxxx xxxxx  xxxx xxxx xxxxx  1940 1940   838  xxxx xxxx xxxxx
Potent Cap.:  802 xxxx xxxxx  xxxx xxxx xxxxx    73   66   369  xxxx xxxx xxxxx
Move Cap.:    802 xxxx xxxxx  xxxx xxxx xxxxx    72   65   369  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   290  261 xxxxx   230  259 xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.05 0.00  0.05  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  328 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 17.1 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx             17.1            xxxxxx
ApproachLOS:        *                 *                C               *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.8       Worst Case Level Of Service: E[ 40.9]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1059    31    31  839     0     0    0     0    11    0    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1059    31    31  839     0     0    0     0    11    0    21
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0 1059    31    31  839     0     0    0     0    11    0    21
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0 1059    31    31  839     0     0    0     0    11    0    21
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1090 xxxx xxxxx  xxxx xxxx xxxxx  1976 1976  1075
Potent Cap.: xxxx xxxx xxxxx   648 xxxx xxxxx  xxxx xxxx xxxxx    69   63   270
Move Cap.:   xxxx xxxx xxxxx   648 xxxx xxxxx  xxxx xxxx xxxxx    67   60   270
Volume/Cap:  xxxx xxxx  xxxx  0.05 xxxx  xxxx  xxxx xxxx  xxxx  0.17 0.00  0.08
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  132 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.9 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 40.9 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    E     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              40.9
ApproachLOS:        *                 *                 *                  E
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.810
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       120                 Level Of Service:                   D
********************************************************************************
Street Name:         Brentwood Blvd.              Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10   10     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      86  581   226   152  694    77   101   42   149   218   71   149
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   86  581   226   152  694    77   101   42   149   218   71   149
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    86  581   226   152  694    77   101   42   149   218   71   149
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   86  581   226   152  694    77   101   42   149   218   71   149
RTOR Reduct:    0    0   218     0    0     0     0    0     0     0    0   149
RTOR Vol:      86  581     8   152  694    77   101   42   149   218   71     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   86  581     8   152  694    77   101   42   149   218   71     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 0.90  0.10  1.00 0.22  0.78  0.75 0.25  1.00
Final Sat.:  1650 1650  1650  1650 1485   165  1650  363  1287  1245  405  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.35  0.00  0.09 0.47  0.47  0.06 0.12  0.12  0.18 0.18  0.00
Crit Volume:   86                        771                191        289
Crit Moves:  ****                       ****               ****       ****
********************************************************************************
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                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: C[ 16.5]
********************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  720   177    16  871     0     0    0     0     0    0    70
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  720   177    16  871     0     0    0     0     0    0    70
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  720   177    16  871     0     0    0     0     0    0    70
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  720   177    16  871     0     0    0     0     0    0    70
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   897 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   809
Potent Cap.: xxxx xxxx xxxxx   765 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   384
Move Cap.:   xxxx xxxx xxxxx   765 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   384
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.18
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.7
Control Del:xxxxx xxxx xxxxx   9.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  16.5
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              16.5
ApproachLOS:        *                *                *                  C
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
********************************************************************************
Average Delay (sec/veh):      1.3       Worst Case Level Of Service: D[ 31.2]
********************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  785    31    19  842    18     0    0    44    24    2    23
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   15  785    31    19  842    18     0    0    44    24    2    23
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    15  785    31    19  842    18     0    0    44    24    2    23
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   15  785    31    19  842    18     0    0    44    24    2    23
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  860 xxxx xxxxx   816 xxxx xxxxx  xxxx xxxx   430  1274 1713   785
Potent Cap.:  790 xxxx xxxxx   820 xxxx xxxxx  xxxx xxxx   629   145   91   396
Move Cap.:    790 xxxx xxxxx   820 xxxx xxxxx  xxxx xxxx   629   131   88   396
Volume/Cap:  0.02 xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  0.07  0.18 0.02  0.06
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx   0.2  xxxx xxxx xxxxx
Control Del:  9.6 xxxx xxxxx   9.5 xxxx xxxxx xxxxx xxxx  11.1 xxxxx xxxx xxxxx
LOS by Move:   A    *     *     A    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  185 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 31.2 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    D     *
ApproachDel:    xxxxxx            xxxxxx              11.1              31.2
ApproachLOS:        *                 *                 B                 D
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.332
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        28                Level Of Service:                   A
********************************************************************************
Street Name:         Brentwood Blvd.                    Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      17  860    51    23  877    10    28    4    32    56    0    35
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   17  860    51    23  877    10    28    4    32    56    0    35
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    17  860    51    23  877    10    28    4    32    56    0    35
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   17  860    51    23  877    10    28    4    32    56    0    35
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    23
RTOR Vol:      17  860    51    23  877    10    28    4    32    56    0    12
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   17  860    51    23  877    10    28    4    32    56    0    12
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.89  0.11  1.00 1.98  0.02  1.00 0.11  0.89  1.00 0.00  1.00
Final Sat.:  1720 3247   193  1720 3401    39  1720  191  1529  1720    0  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.26  0.26  0.01 0.26  0.26  0.02 0.02  0.02  0.03 0.00  0.01
Crit Volume:             456    23                     36          56
Crit Moves:             ****  ****                  ****        ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.497
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 37 Level Of Service: A

Street Name:	Brentwood Blvd.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	151	793	0			18	667	206			191	0	104			16	0	41		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	151	793	0			18	667	206			191	0	104			16	0	41		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	151	793	0			18	667	206			191	0	104			16	0	41		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	151	793	0			18	667	206			191	0	104			16	0	41		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	151	793	0			18	667	206			191	0	104			16	0	41		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	151	793	0			18	667	206			191	0	104			16	0	41		
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.53	0.47			1.00	1.00	1.00			1.00	1.00	1.00		
Final Sat.:	1650	3300	0			1650	2521	779			1650	1650	1650			1650	1650	1650		
Capacity Analysis Module:																				
Vol/Sat:	0.09	0.24	0.00			0.01	0.26	0.26			0.12	0.00	0.06			0.01	0.00	0.02		
Crit Volume:	151						437				191							41		
Crit Moves:	****						****				****							****		

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.297
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 32 Level Of Service: A

Street Name:	Brentwood Blvd.								Technology Way							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	41	803	0			0	731	43			23	0	60			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	41	803	0			0	731	43			23	0	60			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	41	803	0			0	731	43			23	0	60			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	41	803	0			0	731	43			23	0	60			0	0	0		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	41	803	0			0	731	43			23	0	60			0	0	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	41	803	0			0	731	43			23	0	60			0	0	0		
Saturation Flow Module:																				
Sat/Lane:	1720	1720	1720			1720	1720	1720			1720	1720	1720			1720	1720	1720		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.89	0.11			0.28	0.00	0.72			0.00	1.00	0.00		
Final Sat.:	1720	3440	0			1720	3249	191			477	0	1243			0	1720	0		
Capacity Analysis Module:																				
Vol/Sat:	0.02	0.23	0.00			0.00	0.22	0.23			0.05	0.00	0.05			0.00	0.00	0.00		
Crit Volume:	41							387					83				0			
Crit Moves:	****							****					****							

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                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Average Delay (sec/veh):      0.8       Worst Case Level Of Service: C[ 19.0]
********************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  762    37    22  730     0     0     0     0    22     0    33
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  762    37    22  730     0     0     0     0    22     0    33
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  762    37    22  730     0     0     0     0    22     0    33
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0  762    37    22  730     0     0     0     0    22     0    33
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   799 xxxx xxxxx  xxxx xxxx xxxxx  1190 1555   400
Potent Cap.: xxxx xxxx xxxxx   833 xxxx xxxxx  xxxx xxxx xxxxx   183  114   606
Move Cap.:   xxxx xxxx xxxxx   833 xxxx xxxxx  xxxx xxxx xxxxx   180  111   606
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.12 0.00  0.05
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx   9.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  311 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.6 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 19.0 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    C     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             19.0
ApproachLOS:        *                *                *                 C
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```



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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.365
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
********************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      34  477    39    79  570   101   154  227   158    40   84   124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   34  477    39    79  570   101   154  227   158    40   84   124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    34  477    39    79  570   101   154  227   158    40   84   124
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   34  477    39    79  570   101   154  227   158    40   84   124
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    79
RTOR Vol:      34  477    39    79  570   101   154  227   158    40   84    45
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   34  477    39    79  570   101   154  227   158    40   84    45
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.85  0.15  1.00 1.70  0.30  1.00 1.18  0.82  1.00 1.00  1.00
Final Sat.:  1650 3051   249  1650 2803   497  1650 1946  1354  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.16  0.16  0.05 0.20  0.20  0.09 0.12  0.12  0.02 0.05  0.03
Crit Volume:   34                        336               193    40
Crit Moves:  ****                      ****             ****  ****
********************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.398
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 38 Level Of Service: A

Street Name:	O'hara Ave.									Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2	1	0	2	0	1
Volume Module:																				
Base Vol:	149	276	134			80	321	124			163	307	289			32	274	61		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	149	276	134			80	321	124			163	307	289			32	274	61		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	149	276	134			80	321	124			163	307	289			32	274	61		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	149	276	134			80	321	124			163	307	289			32	274	61		
RTOR Reduct:	0	0	32			0	0	124			0	0	149			0	0	61		
RTOR Vol:	149	276	102			80	321	0			163	307	140			32	274	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	149	276	102			80	321	0			163	307	140			32	274	0		
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.91			1.00	1.00	1.00		
Lanes:	1.00	1.00	1.00			1.00	2.00	1.00			1.00	2.00	2.00			1.00	2.00	1.00		
Final Sat.:	1650	1650	1650			1650	3300	1650			1650	3300	3000			1650	3300	1650		
Capacity Analysis Module:																				
Vol/Sat:	0.09	0.17	0.06			0.05	0.10	0.00			0.10	0.09	0.05			0.02	0.08	0.00		
Crit Volume:	276					80					163						137			
Crit Moves:	****					****					****						****			

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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         1.049
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                Level Of Service:                   F
******************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     600  551   41    22  530  486   468   26  579   100   29   35
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  600  551   41    22  530  486   468   26  579   100   29   35
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   600  551   41    22  530  486   468   26  579   100   29   35
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  600  551   41    22  530  486   468   26  579   100   29   35
RTOR Reduct:    0    0   41     0    0    0     0    0  579     0    0   22
RTOR Vol:     600  551    0    22  530  486   468   26    0   100   29   13
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  600  551    0    22  530  486   468   26    0   100   29   13
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.00 1.00  1.00 1.04 0.96  0.95 0.05 1.00  0.78 0.22 1.00
Final Sat.:  1650 1650 1650  1650 1721 1579  1563   87 1650  1279  371 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.36 0.33 0.00  0.01 0.31 0.31  0.30 0.30 0.00  0.08 0.08 0.01
Crit Volume:  600                 508              494              129
Crit Moves:  ****              ****             ****             ****
******************************************************************************
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------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.8       Worst Case Level Of Service: D[ 29.0]
******************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      32 1095     0     0 1302    33    29    0    26     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32 1095     0     0 1302    33    29    0    26     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    32 1095     0     0 1302    33    29    0    26     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   32 1095     0     0 1302    33    29    0    26     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1335 xxxx xxxxx  xxxx xxxx xxxxx  2478 2478  1319  xxxx xxxx xxxxx
Potent Cap.:  523 xxxx xxxxx  xxxx xxxx xxxxx    33   30   194  xxxx xxxx xxxxx
Move Cap.:    523 xxxx xxxxx  xxxx xxxx xxxxx    32   28   194  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   214  193 xxxxx   126  173 xxxxx
Volume/Cap:  0.06 xxxx  xxxx  xxxx xxxx  xxxx  0.14 0.00  0.13  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 12.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  204 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.0 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 29.0 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    D     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             29.0            xxxxxx
ApproachLOS:        *                *               D                 *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: D[ 28.3]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21 1106     0     0 1264    71    27    0    28     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21 1106     0     0 1264    71    27    0    28     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21 1106     0     0 1264    71    27    0    28     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   21 1106     0     0 1264    71    27    0    28     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1335 xxxx xxxxx  xxxx xxxx xxxxx  2448 2448  1300  xxxx xxxx xxxxx
Potent Cap.:  523 xxxx xxxxx  xxxx xxxx xxxxx    35   32   199  xxxx xxxx xxxxx
Move Cap.:    523 xxxx xxxxx  xxxx xxxx xxxxx    34   30   199  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   220  199 xxxxx   137  182 xxxxx
Volume/Cap:  0.04 xxxx  xxxx  xxxx xxxx  xxxx  0.12 0.00  0.14  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 12.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  209 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.0 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 28.3 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    D     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx             28.3            xxxxxx
ApproachLOS:        *                 *                D               *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: F[ 83.1]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1148    18    15 1340     0     0    0     0     4    0     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1148    18    15 1340     0     0    0     0     4    0     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0 1148    18    15 1340     0     0    0     0     4    0     4
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0 1148    18    15 1340     0     0    0     0     4    0     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1166 xxxx xxxxx  xxxx xxxx xxxxx  2527 2527  1157
Potent Cap.: xxxx xxxx xxxxx   606 xxxx xxxxx  xxxx xxxx xxxxx    31   28   241
Move Cap.:   xxxx xxxx xxxxx   606 xxxx xxxxx  xxxx xxxx xxxxx    30   27   241
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.13 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   54 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.5 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 83.1 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              83.1
ApproachLOS:        *                 *                 *                  F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 1.178
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F

Street Name:	Brentwood Blvd.									Grant Street / Sunset Rd.								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	0	1	0	1	0	0	1	0	0	1	0	0	1
Volume Module:																				
Base Vol:	121	751	238		178	1191		89		61	44		101	329		68	245			
Growth Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Initial Bse:	121	751	238		178	1191		89		61	44		101	329		68	245			
User Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Volume:	121	751	238		178	1191		89		61	44		101	329		68	245			
Reduct Vol:	0	0	0		0	0		0		0	0		0	0		0	0			
Reduced Vol:	121	751	238		178	1191		89		61	44		101	329		68	245			
RTOR Reduct:	0	0	238		0	0		0		0	0		0	0		0	178			
RTOR Vol:	121	751	0		178	1191		89		61	44		101	329		68	67			
PCE Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
MLF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
FinalVolume:	121	751	0		178	1191		89		61	44		101	329		68	67			
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650		1650	1650		1650		1650	1650		1650	1650		1650	1650			
Adjustment:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Lanes:	1.00	1.00	1.00		1.00	0.93		0.07		1.00	0.30		0.70	0.83		0.17	1.00			
Final Sat.:	1650	1650	1650		1650	1535		115		1650	501		1149	1367		283	1650			
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.46	0.00		0.11	0.78		0.78		0.04	0.09		0.09	0.24		0.24	0.04			
Crit Volume:	121							1280					145			397				
Crit Moves:	****							****					****			****				

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Average Delay (sec/veh): 2.4 Worst Case Level Of Service: D[33.9]

Street Name:	Brentwood Blvd.									Sunset Ct.								
Approach:	North Bound					South Bound				East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Volume Module:																				
Base Vol:	0	945	177			7	1059		0		0	0		0		0	0		166	
Growth Adj:	1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	0	945	177			7	1059		0		0	0		0		0	0		166	
User Adj:	1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	0	945	177			7	1059		0		0	0		0		0	0		166	
Reduct Vol:	0	0	0			0	0		0		0	0		0		0	0		0	
FinalVolume:	0	945	177			7	1059		0		0	0		0		0	0		166	
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx		4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx		6.2						
FollowUpTim:	xxxxx	xxxx	xxxxx		2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx		3.3						
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx		1122	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		1034						
Potent Cap.:	xxxx	xxxx	xxxxx		630	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		285						
Move Cap.:	xxxx	xxxx	xxxxx		630	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		285						
Volume/Cap:	xxxx	xxxx	xxxx		0.01	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx		0.58						
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx		0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		3.4						
Control Del:	xxxxx	xxxx	xxxxx		10.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx		33.9						
LOS by Move:	*	*	*		B	*	*	*	*	*	*	*		D						
Movement:	LT -	LTR -	RT		LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT							
Shared Cap.:	xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx							
SharedQueue:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx							
Shrd ConDel:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx							
Shared LOS:	*	*	*		*	*	*	*	*	*	*	*	*							
ApproachDel:	xxxxxx				xxxxxx			xxxxxx				33.9								
ApproachLOS:	*				*			*				D								

Note: Queue reported is the number of cars per lane.

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                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      1.5       Worst Case Level Of Service: F[ 63.4]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      19 1017    28    24 1131    20     0    0    22    25    0    17
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   19 1017    28    24 1131    20     0    0    22    25    0    17
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    19 1017    28    24 1131    20     0    0    22    25    0    17
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   19 1017    28    24 1131    20     0    0    22    25    0    17
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1151 xxxx xxxxx  1045 xxxx xxxxx  xxxx xxxx   576  1669 2254  1017
Potent Cap.:  614 xxxx xxxxx   673 xxxx xxxxx  xxxx xxxx   521    77   42   291
Move Cap.:    614 xxxx xxxxx   673 xxxx xxxxx  xxxx xxxx   521    70   39   291
Volume/Cap:  0.03 xxxx  xxxx  0.04 xxxx  xxxx  xxxx xxxx  0.04  0.35 0.00  0.06
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx   0.1  xxxx xxxx xxxxx
Control Del: 11.0 xxxx xxxxx  10.5 xxxx xxxxx xxxxx xxxx  12.2 xxxxx xxxx xxxxx
LOS by Move:   B    *     *     B    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  102 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.7 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 63.4 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx              12.2              63.4
ApproachLOS:        *                 *                 B                 F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.385
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        30                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                    Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21  994    48    25 1117    14    12    0    23    58    5    28
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21  994    48    25 1117    14    12    0    23    58    5    28
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21  994    48    25 1117    14    12    0    23    58    5    28
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21  994    48    25 1117    14    12    0    23    58    5    28
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    25
RTOR Vol:      21  994    48    25 1117    14    12    0    23    58    5     3
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   21  994    48    25 1117    14    12    0    23    58    5     3
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.91  0.09  1.00 1.98  0.02  1.00 0.00  1.00  0.92 0.08  1.00
Final Sat.:  1720 3282   158  1720 3397    43  1720    0  1720  1583  137  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.30  0.30  0.01 0.33  0.33  0.01 0.00  0.01  0.04 0.04  0.00
Crit Volume:   21                    566          12                     63
Crit Moves:  ****                 ****        ****                   ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.740
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 71 Level Of Service: C

Street Name:	Brentwood Blvd.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																														
Base Vol:	235	854	0			34	1044	283			283	0	172			71	0	39		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	235	854	0			34	1044	283			283	0	172			71	0	39		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	235	854	0			34	1044	283			283	0	172			71	0	39		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	235	854	0			34	1044	283			283	0	172			71	0	39		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	235	854	0			34	1044	283			283	0	172			71	0	39		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	235	854	0			34	1044	283			283	0	172			71	0	39		
Saturation Flow Module:																														
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.57	0.43			1.00	1.00	1.00			1.00	1.00	1.00		
Final Sat.:	1650	3300	0			1650	2596	704			1650	1650	1650			1650	1650	1650		
Capacity Analysis Module:																														
Vol/Sat:	0.14	0.26	0.00			0.02	0.40	0.40			0.17	0.00	0.10			0.04	0.00	0.02		
Crit Volume:	235						664				283							39		
Crit Moves:	****						****				****							****		

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.433
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 40 Level Of Service: A

Street Name:	Brentwood Blvd.								Technology Way							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																														
Base Vol:	42	1013	0			0	1175	21			41	0	63			0	0	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	42	1013	0			0	1175	21			41	0	63			0	0	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	42	1013	0			0	1175	21			41	0	63			0	0	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	42	1013	0			0	1175	21			41	0	63			0	0	0		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	42	1013	0			0	1175	21			41	0	63			0	0	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	42	1013	0			0	1175	21			41	0	63			0	0	0		
Saturation Flow Module:																														
Sat/Lane:	1720	1720	1720			1720	1720	1720			1720	1720	1720			1720	1720	1720		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	2.00	0.00			1.00	1.96	0.04			0.39	0.00	0.61			0.00	1.00	0.00		
Final Sat.:	1720	3440	0			1720	3380	60			678	0	1042			0	1720	0		
Capacity Analysis Module:																														
Vol/Sat:	0.02	0.29	0.00			0.00	0.35	0.35			0.06	0.00	0.06			0.00	0.00	0.00		
Crit Volume:	42						598						104				0			
Crit Moves:	****						****						****							

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------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
******************************************************************************
Average Delay (sec/veh):      2.6       Worst Case Level Of Service: F[ 55.2]
******************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  883    65    58 1116     0     0    0     0    47    0    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  883    65    58 1116     0     0    0     0    47    0    46
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  883    65    58 1116     0     0    0     0    47    0    46
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  883    65    58 1116     0     0    0     0    47    0    46
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   948 xxxx xxxxx  xxxx xxxx xxxxx  1590 2148   474
Potent Cap.: xxxx xxxx xxxxx   732 xxxx xxxxx  xxxx xxxx xxxxx   100   49   542
Move Cap.:   xxxx xxxx xxxxx   732 xxxx xxxxx  xxxx xxxx xxxxx    94   45   542
Volume/Cap:  xxxx xxxx  xxxx  0.08 xxxx  xxxx  xxxx xxxx  xxxx  0.50 0.00  0.08
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  159 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  3.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 55.2 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             55.2
ApproachLOS:        *                *                *                 F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.506
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        38                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      39  620    38   138  869   130   237  158    89    33   59   109
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   39  620    38   138  869   130   237  158    89    33   59   109
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    39  620    38   138  869   130   237  158    89    33   59   109
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   39  620    38   138  869   130   237  158    89    33   59   109
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   109
RTOR Vol:      39  620    38   138  869   130   237  158    89    33   59     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   39  620    38   138  869   130   237  158    89    33   59     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.88  0.12  1.00 1.74  0.26  1.00 1.28  0.72  1.00 1.00  1.00
Final Sat.:  1650 3109   191  1650 2871   429  1650 2111  1189  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.20  0.20  0.08 0.30  0.30  0.14 0.07  0.07  0.02 0.04  0.00
Crit Volume:   39                    500         237                     59
Crit Moves:  ****                 ****        ****                    ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.585
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 55 Level Of Service: A

Street Name:	O'hara Ave.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	4	4			4	4	4			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	1	0	2	0	2	1	0	2	0	1
Volume Module:																				
Base Vol:	378	340	185			120	370	245			170	389	288			154	464	91		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	378	340	185			120	370	245			170	389	288			154	464	91		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	378	340	185			120	370	245			170	389	288			154	464	91		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	378	340	185			120	370	245			170	389	288			154	464	91		
RTOR Reduct:	0	0	154			0	0	170			0	0	288			0	0	91		
RTOR Vol:	378	340	31			120	370	75			170	389	0			154	464	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	378	340	31			120	370	75			170	389	0			154	464	0		
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.91			1.00	1.00	1.00		
Lanes:	1.00	1.00	1.00			1.00	2.00	1.00			1.00	2.00	2.00			1.00	2.00	1.00		
Final Sat.:	1650	1650	1650			1650	3300	1650			1650	3300	3000			1650	3300	1650		
Capacity Analysis Module:																				
Vol/Sat:	0.23	0.21	0.02			0.07	0.11	0.05			0.10	0.12	0.00			0.09	0.14	0.00		
Crit Volume:	378						185				170						232			
Crit Moves:	****						****				****						****			

Scenario Report

Scenario:	CUM AM
Command:	Default
Volume:	CUM AM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12	1080			0	0	832			10	14			0	17	0			0	0
ApproachDel:	xxxxxx					xxxxxx					41.7					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=31]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1965]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	12	1080			0	0	832			10	14			0	17	0			0	0

Major Street Volume: 1934
Minor Approach Volume: 31
Minor Approach Volume Threshold: 58 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	10	1082		0	0	834		8	14		0	0	17		0	0 0
ApproachDel:	xxxxxx				xxxxxx				41.6				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=31]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1965]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	10	1082		0	0	834		8	14		0	0	17		0	0 0

Major Street Volume: 1934
Minor Approach Volume: 31
Minor Approach Volume Threshold: 58 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1059    31    31  839     0     0    0     0    11    0    21
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             40.9
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=32]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1992]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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--------------------------------------------------------------------------------
                  Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1059    31    31  839     0     0    0     0    11    0    21
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1960
Minor Approach Volume:           32
Minor Approach Volume Threshold: 53 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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Peak Hour Delay Signal Warrant Report

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	720	177		16	871		0	0		0	0	0		0	70
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				16.5			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=70]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1854]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	720	177		16	871		0	0		0	0	0		0	70

Major Street Volume: 1784
Minor Approach Volume: 70
Minor Approach Volume Threshold: 85 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	15		785		31	19		842		18	14		1		29	24		2		23
ApproachDel:	xxxxxx					xxxxxx					36.8					30.9				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=44]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1803]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=49]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1803]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	15		785		31	19		842		18	14		1		29	24		2		23

Major Street Volume: 1710
Minor Approach Volume: 49
Minor Approach Volume Threshold: 100

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  762    37    22  730     0     0    0     0    22    0    33
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             19.0
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=55]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=1606]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0  762    37    22  730     0     0    0     0    22    0    33
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1551
Minor Approach Volume:           55
Minor Approach Volume Threshold: 134
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Scenario Report

Scenario:	CUM PM
Command:	Default
Volume:	CUM PM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

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Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / Yes	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

****

Intersection #2 Brentwood Blvd. @ Sunrise Drive

****

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	32	1095		0	0	1302		33	29		0	26	0		0	0
ApproachDel:	xxxxxx				xxxxxx				264.7				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=4.0]
SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=55]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2517]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	32	1095		0	0	1302		33	29		0	26	0		0	0

Major Street Volume: 2462
Minor Approach Volume: 55
Minor Approach Volume Threshold: -26 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	1	0	1	0 0	0	0	0	1 0	0	0	1!	0 0	0	0	0	0 0
Initial Vol:	21	1106		0	0	1264		71	27		0	28	0		0	0
ApproachDel:	xxxxxx				xxxxxx				215.6				xxxxxx			

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=3.3]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=55]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2517]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   21 1106     0     0 1264    71    27    0    28     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2462
Minor Approach Volume:           55
Minor Approach Volume Threshold: -26 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1148    18    15 1340     0     0    0     0     4    0     4
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              83.1
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=8]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2529]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1148    18    15 1340     0     0     0     0     4     0     4
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2521
Minor Approach Volume:           8
Minor Approach Volume Threshold: -34 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0  945   177     7 1059     0     0     0     0     0     0   166
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              33.9
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=166]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2354]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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--------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0  945   177     7 1059     0     0     0     0     0     0   166
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2188
Minor Approach Volume:           166
Minor Approach Volume Threshold: 15 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   19 1017    28    24 1131    20     7     1    14    25     0    17
ApproachDel:    xxxxxx           xxxxxx              80.7              63.8
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=22]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2303]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=42]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2303]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	19		1017		28	24		1131		20	7		1		14	25		0		17

Major Street Volume: 2239
Minor Approach Volume: 42
Minor Approach Volume Threshold: 7 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Delay Signal Warrant Report

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0	883		65		58	1116			0	0		0		0	47		0		46
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					55.2				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=93]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2215]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0		883		65	58		1116		0	0		0		0	47		0		46

Major Street Volume: 2122
Minor Approach Volume: 93
Minor Approach Volume Threshold: 26 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

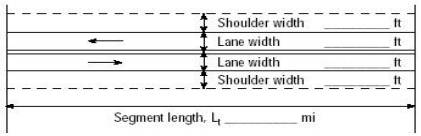
The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*AM Peak*	Analysis Year	*Cumulative*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1735* veh/h
Directional split	*51 / 49*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1910*
v_p * highest directional split proportion[2] (pc/h)	*974*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.2*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*19.0*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*1907*
v_p * highest directional split proportion[2] (pc/h)	*973*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*81.3*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*4.9*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*86.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*E*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.60*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*95*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*347*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*5.0*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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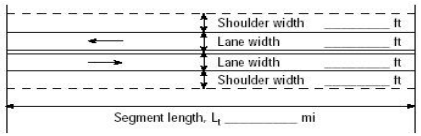
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*PM Peak*	Analysis Year	*Cumulative*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*2188* veh/h
Directional split	*51 / 49*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*2409*
v_p * highest directional split proportion[2] (pc/h)	*1229*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.1*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*15.2*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*2404*
v_p * highest directional split proportion[2] (pc/h)	*1226*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*87.9*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*3.0*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*91.0*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*E*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.75*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*120*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*438*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*7.9*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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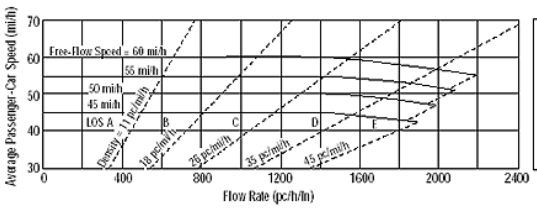
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1024	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	571
Speed, S (mi/h)	45.0
D (pc/mi/ln)	12.7
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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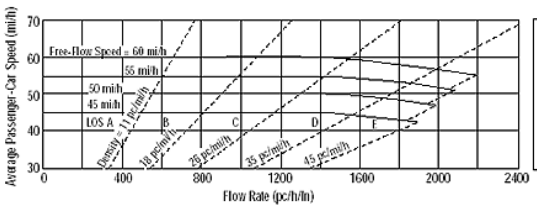
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	891	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	497
Speed, S (mi/h)	45.0
D (pc/mi/ln)	11.0+
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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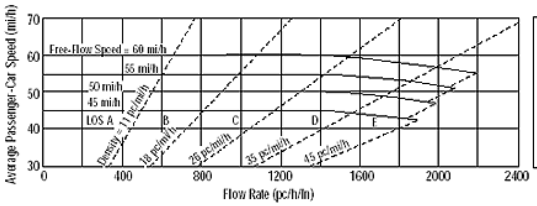
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1176	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	663
Speed, S (mi/h)	45.0
D (pc/mi/ln)	14.7
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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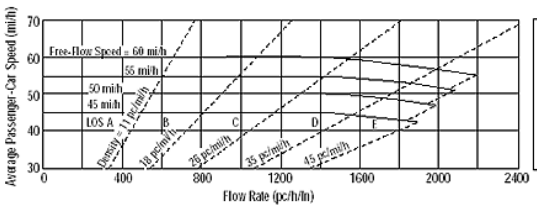
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1361	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	768
Speed, S (mi/h)	45.0
D (pc/mi/ln)	17.1
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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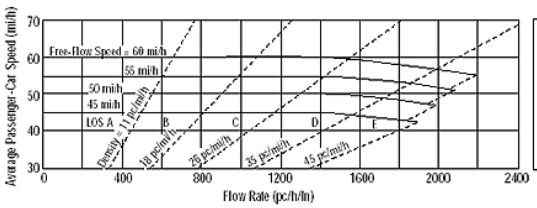
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	295	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	175
Speed, S (mi/h)	45.0
D (pc/mi/ln)	3.9
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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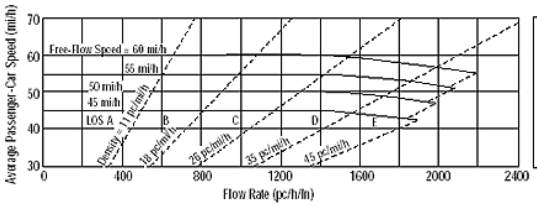
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	357	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	212
Speed, S (mi/h)	45.0
D (pc/mi/ln)	4.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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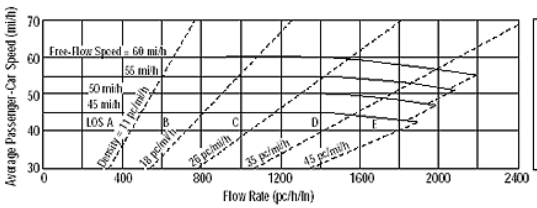
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	455	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	262
Speed, S (mi/h)	45.0
D (pc/mi/ln)	5.8
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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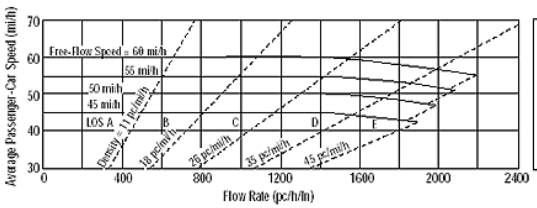
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	518	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	298
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.6
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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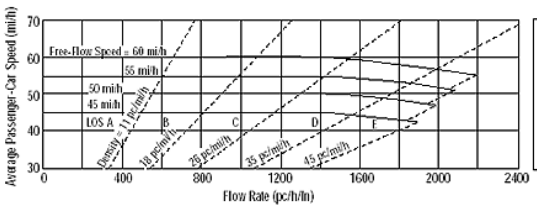
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	944	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	510
Speed, S (mi/h)	45.0
D (pc/mi/ln)	11.3
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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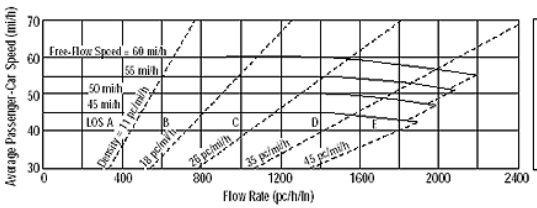
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	787	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	425
Speed, S (mi/h)	45.0
D (pc/mi/ln)	9.4
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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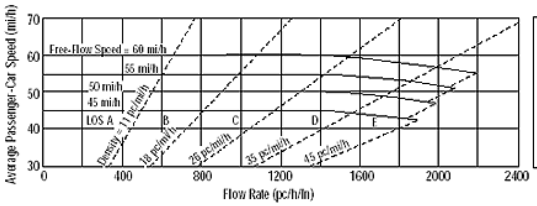
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1089	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	628
Speed, S (mi/h)	45.0
D (pc/mi/ln)	14.0
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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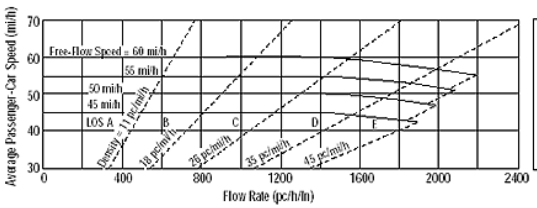
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1287	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	742
Speed, S (mi/h)	45.0
D (pc/mi/ln)	16.5
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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Appendix F:

Analysis Worksheets for
Cumulative plus Proposed Project Conditions

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Brentwood Blvd @ Lone Tree Way (S)
******************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         0.924
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 Level Of Service:                   E
******************************************************************************
Street Name:          Brentwood Blvd                 Lone Tree Way (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include           Ovl             Include
Min. Green:     4    8    8     4    8    8     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  1  1  0    0  1  0  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     636  542   77    41  609  322   325   49  636    32   17   14
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  636  542   77    41  609  322   325   49  636    32   17   14
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   636  542   77    41  609  322   325   49  636    32   17   14
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  636  542   77    41  609  322   325   49  636    32   17   14
RTOR Reduct:    0    0   32     0    0    0     0    0  636     0    0   14
RTOR Vol:     636  542   45    41  609  322   325   49    0    32   17    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  636  542   45    41  609  322   325   49    0    32   17    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.00 1.00  1.00 1.31 0.69  0.87 0.13 1.00  0.65 0.35 1.00
Final Sat.:  1650 1650 1650  1650 2159 1141  1434  216 1650  1078  572 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.39 0.33 0.03  0.02 0.28 0.28  0.23 0.23 0.00  0.03 0.03 0.00
Crit Volume:  636                        466        374               49
Crit Moves:  ****                       ****       ****             ****
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: C[ 23.1]
******************************************************************************
Street Name:         Brentwood Blvd.                    Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      12 1242     0     0 1168    10    14    0    17     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   12 1242     0     0 1168    10    14    0    17     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    12 1242     0     0 1168    10    14    0    17     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   12 1242     0     0 1168    10    14    0    17     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1178 xxxx xxxxx  xxxx xxxx xxxxx  2439 2439  1173  xxxx xxxx xxxxx
Potent Cap.:  600 xxxx xxxxx  xxxx xxxx xxxxx    35   32   236  xxxx xxxx xxxxx
Move Cap.:    600 xxxx xxxxx  xxxx xxxx xxxxx    35   31   236  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   223  202 xxxxx   164  198 xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.06 0.00  0.07  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 11.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  230 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.5 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 23.1 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx             23.1           xxxxxx
ApproachLOS:        *                *                C                *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):      0.3       Worst Case Level Of Service: C[ 23.0]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10 1244     0     0 1170     8    14     0    17     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10 1244     0     0 1170     8    14     0    17     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10 1244     0     0 1170     8    14     0    17     0    0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0    0     0
FinalVolume:   10 1244     0     0 1170     8    14     0    17     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1178 xxxx xxxxx  xxxx xxxx xxxxx  2438 2438  1174  xxxx xxxx xxxxx
Potent Cap.:  600 xxxx xxxxx  xxxx xxxx xxxxx    35   32   236  xxxx xxxx xxxxx
Move Cap.:    600 xxxx xxxxx  xxxx xxxx xxxxx    35   31   236  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   224  203 xxxxx   165  199 xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  0.06 0.00  0.07  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 11.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  230 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.5 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 23.0 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx              23.0            xxxxxx
ApproachLOS:        *                 *                 C               *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      1.3       Worst Case Level Of Service: F[ 88.7]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1221    31    31 1175     0     0    0     0    11    0    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1221    31    31 1175     0     0    0     0    11    0    21
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0 1221    31    31 1175     0     0    0     0    11    0    21
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0 1221    31    31 1175     0     0    0     0    11    0    21
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1252 xxxx xxxxx  xxxx xxxx xxxxx  2474 2474  1237
Potent Cap.: xxxx xxxx xxxxx   563 xxxx xxxxx  xxxx xxxx xxxxx    33   30   217
Move Cap.:   xxxx xxxx xxxxx   563 xxxx xxxxx  xxxx xxxx xxxxx    32   29   217
Volume/Cap:  xxxx xxxx  xxxx  0.06 xxxx  xxxx  xxxx xxxx  xxxx  0.34 0.00  0.10
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   73 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.8 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 88.7 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              88.7
ApproachLOS:        *                 *                 *                  F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         1.014
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 Level Of Service:                   F
********************************************************************************
Street Name:         Brentwood Blvd.             Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10   10     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      86  743   226   152 1030    77   101   42   149   218   71   149
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   86  743   226   152 1030    77   101   42   149   218   71   149
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    86  743   226   152 1030    77   101   42   149   218   71   149
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   86  743   226   152 1030    77   101   42   149   218   71   149
RTOR Reduct:    0    0   218     0    0     0     0    0     0     0    0   149
RTOR Vol:      86  743     8   152 1030    77   101   42   149   218   71     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   86  743     8   152 1030    77   101   42   149   218   71     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 0.93  0.07  1.00 0.22  0.78  0.75 0.25  1.00
Final Sat.:  1650 1650  1650  1650 1535   115  1650  363  1287  1245  405  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.45  0.00  0.09 0.67  0.67  0.06 0.12  0.12  0.18 0.18  0.00
Crit Volume:   86                 1107                    191        289
Crit Moves:  ****                 ****                   ****       ****
********************************************************************************
```



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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: C[ 20.0]
********************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  882   177    16 1207     0     0    0     0     0    0    70
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  882   177    16 1207     0     0    0     0     0    0    70
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  882   177    16 1207     0     0    0     0     0    0    70
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  882   177    16 1207     0     0    0     0     0    0    70
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1059 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   971
Potent Cap.: xxxx xxxx xxxxx   665 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   310
Move Cap.:   xxxx xxxx xxxxx   665 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   310
Volume/Cap:  xxxx xxxx  xxxx  0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.23
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.9
Control Del:xxxxx xxxx xxxxx  10.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  20.0
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              20.0
ApproachLOS:        *                *                *                  C
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      1.7       Worst Case Level Of Service: F[ 60.1]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  947    31    19 1178    18     0    0    44    24    2    23
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   15  947    31    19 1178    18     0    0    44    24    2    23
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    15  947    31    19 1178    18     0    0    44    24    2    23
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   15  947    31    19 1178    18     0    0    44    24    2    23
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1196 xxxx xxxxx   978 xxxx xxxxx  xxxx xxxx   598  1604 2211   947
Potent Cap.:  591 xxxx xxxxx   714 xxxx xxxxx  xxxx xxxx   506    86   45   319
Move Cap.:    591 xxxx xxxxx   714 xxxx xxxxx  xxxx xxxx   506    75   42   319
Volume/Cap:  0.03 xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  0.09  0.32 0.05  0.07
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx   0.3  xxxx xxxx xxxxx
Control Del: 11.3 xxxx xxxxx  10.2 xxxx xxxxx xxxxx xxxx  12.8 xxxxx xxxx xxxxx
LOS by Move:   B    *     *     B    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  112 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.9 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 60.1 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx              12.8              60.1
ApproachLOS:        *                 *                 B                 F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.419
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        32                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                  Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      17 1022    51    23 1213    10    28    4    32    56    0    35
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   17 1022    51    23 1213    10    28    4    32    56    0    35
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    17 1022    51    23 1213    10    28    4    32    56    0    35
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   17 1022    51    23 1213    10    28    4    32    56    0    35
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    23
RTOR Vol:      17 1022    51    23 1213    10    28    4    32    56    0    12
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   17 1022    51    23 1213    10    28    4    32    56    0    12
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.90  0.10  1.00 1.98  0.02  1.00 0.11  0.89  1.00 0.00  1.00
Final Sat.:  1720 3276   164  1720 3412    28  1720  191  1529  1720    0  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.31  0.31  0.01 0.36  0.36  0.02 0.02  0.02  0.03 0.00  0.01
Crit Volume:   17                    612                 36          56
Crit Moves:  ****                 ****               ****        ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.731
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 69 Level Of Service: C

Street Name:	Brentwood Blvd.									Sand Creek Rd.								
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	166	817	250			304	717	206			191	179	136			136	86	178		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	166	817	250			304	717	206			191	179	136			136	86	178		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	166	817	250			304	717	206			191	179	136			136	86	178		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	166	817	250			304	717	206			191	179	136			136	86	178		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	166	817	250			304	717	206			191	179	136			136	86	178		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	166	817	250			304	717	206			191	179	136			136	86	178		
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	1.53	0.47			1.00	1.55	0.45			1.00	1.14	0.86			1.00	1.00	1.00		
Final Sat.:	1650	2527	773			1650	2563	737			1650	1875	1425			1650	1650	1650		
Capacity Analysis Module:																				
Vol/Sat:	0.10	0.32	0.32			0.18	0.28	0.28			0.12	0.10	0.10			0.08	0.05	0.11		
Crit Volume:		534				304					191							178		
Crit Moves:		****				****					****							****		

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.469
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 43 Level Of Service: A

Street Name:	Brentwood Blvd.									Technology Way								
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	41	1053	44			82	851	43			23	0	60			21	0	39		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	41	1053	44			82	851	43			23	0	60			21	0	39		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	41	1053	44			82	851	43			23	0	60			21	0	39		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	41	1053	44			82	851	43			23	0	60			21	0	39		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	0		
RTOR Vol:	41	1053	44			82	851	43			23	0	60			21	0	39		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	41	1053	44			82	851	43			23	0	60			21	0	39		
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	1.92	0.08			1.00	1.90	0.10			0.28	0.00	0.72			0.35	0.00	0.65		
Final Sat.:	1650	3168	132			1650	3141	159			457	0	1193			578	0	1073		
Capacity Analysis Module:																				
Vol/Sat:	0.02	0.33	0.33			0.05	0.27	0.27			0.05	0.00	0.05			0.04	0.00	0.04		
Crit Volume:			549			82							83			60				
Crit Moves:			****			****							****			****				

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------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
******************************************************************************
Average Delay (sec/veh):      0.9       Worst Case Level Of Service: D[ 30.4]
******************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1056    37    22  871     0     0     0     0    22     0    33
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1056    37    22  871     0     0     0     0    22     0    33
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1056    37    22  871     0     0     0     0    22     0    33
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1056    37    22  871     0     0     0     0    22     0    33
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1093 xxxx xxxxx  xxxx xxxx xxxxx  1554 1990   547
Potent Cap.: xxxx xxxx xxxxx   646 xxxx xxxxx  xxxx xxxx xxxxx   106   62   487
Move Cap.:   xxxx xxxx xxxxx   646 xxxx xxxxx  xxxx xxxx xxxxx   103   59   487
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.21 0.00  0.07
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  10.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  196 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 30.4 xxxxx
Shared LOS:    *    *     *     *    *     *     *     *     *     *     D     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             30.4
ApproachLOS:        *                *                *                 D
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.436
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        36                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      34  729    39    79  691   121   196  227   158    40   84   124
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   34  729    39    79  691   121   196  227   158    40   84   124
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    34  729    39    79  691   121   196  227   158    40   84   124
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   34  729    39    79  691   121   196  227   158    40   84   124
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    79
RTOR Vol:      34  729    39    79  691   121   196  227   158    40   84    45
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   34  729    39    79  691   121   196  227   158    40   84    45
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.90  0.10  1.00 1.70  0.30  1.00 1.18  0.82  1.00 1.00  1.00
Final Sat.:  1650 3132   168  1650 2808   492  1650 1946  1354  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.23  0.23  0.05 0.25  0.25  0.12 0.12  0.12  0.02 0.05  0.03
Crit Volume:   34                    406         196                     84
Crit Moves:  ****                 ****        ****                    ****
******************************************************************************
```

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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #13 O'hara Ave. @ Sand Creek Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.428
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        40                Level Of Service:                  A
********************************************************************************
Street Name:           O'hara Ave.                    Sand Creek Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4    4    4    4    4    4    4    4    4    4    4    4    4
Lanes:        1  0  1  0  1    1  0  2  0  1    1  0  2  0  2    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     149  276   134    80  321   124   163  517   289    32  375    61
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  149  276   134    80  321   124   163  517   289    32  375    61
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   149  276   134    80  321   124   163  517   289    32  375    61
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  149  276   134    80  321   124   163  517   289    32  375    61
RTOR Reduct:    0    0    32     0    0   124     0    0   149     0    0    61
RTOR Vol:     149  276   102    80  321     0   163  517   140    32  375     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  149  276   102    80  321     0   163  517   140    32  375     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.91  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 2.00  1.00  1.00 2.00  2.00  1.00 2.00  1.00
Final Sat.:  1650 1650  1650  1650 3300  1650  1650 3300  3000  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.17  0.06  0.05 0.10  0.00  0.10 0.16  0.05  0.02 0.11  0.00
Crit Volume:       276          80              163                   188
Crit Moves:       ****        ****             ****                  ****
********************************************************************************
```

Scenario Report

Scenario:	CUM + PP PM
Command:	Default
Volume:	CUM + PP PM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Brentwood Blvd @ Lone Tree Way	F	xxxxx	1.175	F	xxxxx	1.175	+ 0.000 V/C
# 2 Brentwood Blvd. @ Sunrise Dri	F	854.1	0.000	F	854.1	0.000	+ 0.000 D/V
# 3 Brentwood Blvd. @ Gregory Lane	F	718.5	0.000	F	718.5	0.000	+ 0.000 D/V
# 4 Brentwood Blvd. @ Homecoming W	F	197.6	0.000	F	197.6	0.000	+ 0.000 D/V
# 5 Brentwood Blvd. @ Grant Street	F	xxxxx	1.295	F	xxxxx	1.295	+ 0.000 V/C
# 6 Brentwood Blvd. @ Sunset Ct.	F	92.2	0.000	F	92.2	0.000	+ 0.000 D/V
# 7 Brentwood Blvd. @ Havenwood Av	F	192.1	0.000	F	192.1	0.000	+ 0.000 D/V
# 8 Brentwood Blvd. @ Applewood Co	A	xxxxx	0.453	A	xxxxx	0.453	+ 0.000 V/C
# 9 Brentwood Blvd. @ Sand Creek R	E	xxxxx	0.936	E	xxxxx	0.936	+ 0.000 V/C
# 10 Brentwood Blvd. @ Technology W	B	xxxxx	0.627	B	xxxxx	0.627	+ 0.000 V/C
# 11 Brentwood Blvd. @ Village Driv	F	139.9	0.000	F	139.9	0.000	+ 0.000 D/V
# 12 Brentwood Blvd. @ Central Blvd	B	xxxxx	0.605	B	xxxxx	0.605	+ 0.000 V/C
# 13 O'hara Ave. @ Sand Creek Rd.	B	xxxxx	0.645	B	xxxxx	0.645	+ 0.000 V/C

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #1 Brentwood Blvd @ Lone Tree Way (S)

Cycle (sec): 100 Critical Vol./Cap.(X): 1.175
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F

Street Name:	Brentwood Blvd									Lone Tree Way (S)								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Ovl					Include				
Min. Green:	4	8	8		4	8	8		4	4	4		4	4	4					
Lanes:	1	0	1	0	1	1	0	1	1	0	0	1	0	0	1	0	1	0	0	1
Volume Module:																				
Base Vol:	759	710		41		22	627		486		468		26		676	100		29		35
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	759	710		41		22	627		486		468		26		676	100		29		35
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Volume:	759	710		41		22	627		486		468		26		676	100		29		35
Reduct Vol:	0	0		0		0	0		0		0		0		0	0		0		0
Reduced Vol:	759	710		41		22	627		486		468		26		676	100		29		35
RTOR Reduct:	0	0		41		0	0		0		0		0		676	0		0		22
RTOR Vol:	759	710		0		22	627		486		468		26		0	100		29		13
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
FinalVolume:	759	710		0		22	627		486		468		26		0	100		29		13
Saturation Flow Module:																				
Sat/Lane:	1650	1650		1650		1650	1650		1650		1650		1650		1650	1650		1650		1650
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
Lanes:	1.00	1.00		1.00		1.00	1.13		0.87		0.95		0.05		1.00	0.78		0.22		1.00
Final Sat.:	1650	1650		1650		1650	1859		1441		1563		87		1650	1279		371		1650
Capacity Analysis Module:																				
Vol/Sat:	0.46	0.43		0.00		0.01	0.34		0.34		0.30		0.30		0.00	0.08		0.08		0.01
Crit Volume:	759								557				494					129		
Crit Moves:	****								****				****					****		

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Average Delay (sec/veh): 15.7 Worst Case Level Of Service: F[854.1]

Street Name:	Brentwood Blvd.									Sunrise Dr.								
Approach:	North Bound					South Bound				East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Volume Module:																				
Base Vol:	32	1413		0		0	1496		33		29		0		26	0		0		0
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	32	1413		0		0	1496		33		29		0		26	0		0		0
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Volume:	32	1413		0		0	1496		33		29		0		26	0		0		0
Reduct Vol:	0	0		0		0	0		0		0		0		0	0		0		0
FinalVolume:	32	1413		0		0	1496		33		29		0		26	0		0		0
Critical Gap Module:																				
Critical Gp:	4.1	xxxx	xxxxx	xxxxx		xxxx	xxxxx		6.4		6.5		6.2		xxxxx	xxxx		xxxxx		
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx		xxxx	xxxxx		3.5		4.0		3.3		xxxxx	xxxx		xxxxx		
Capacity Module:																				
Cnflict Vol:	1529	xxxx	xxxxx	xxxx		xxxx	xxxxx		2990		2990		1513		xxxx	xxxx		xxxxx		
Potent Cap.:	441	xxxx	xxxxx	xxxx		xxxx	xxxxx		16		14		149		xxxx	xxxx		xxxxx		
Move Cap.:	441	xxxx	xxxxx	xxxx		xxxx	xxxxx		15		13		149		xxxx	xxxx		xxxxx		
Volume/Cap:	0.07	xxxx	xxxx	xxxx		xxxx	xxxx		1.97		0.00		0.17		xxxx	xxxx		xxxx		
Level Of Service Module:																				
2Way95thQ:	0.2	xxxx	xxxxx	xxxx		xxxx	xxxxx		xxxx		xxxx		xxxxx		xxxx	xxxx		xxxxx		
Control Del:	13.8	xxxx	xxxxx	xxxxx		xxxx	xxxxx		xxxxx		xxxx		xxxxx		xxxxx	xxxx		xxxxx		
LOS by Move:	B	*		*		*	*		*		*		*		*	*		*		
Movement:	LT - LTR - RT					LT - LTR - RT					LT - LTR - RT					LT - LTR - RT				
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx		xxxx	xxxxx		xxxx		26		xxxxx		xxxx	xxxx		xxxxx		
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx		xxxx	xxxxx		xxxxx		6.7		xxxxx		xxxxx	xxxx		xxxxx		
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx		xxxx	xxxxx		xxxxx		854		xxxxx		xxxxx	xxxx		xxxxx		
Shared LOS:	*	*		*		*	*		*		F		*		*	*		*		
ApproachDel:	xxxxxx					xxxxxx					854.1					xxxxxx				
ApproachLOS:	*					*					F					*				

Note: Queue reported is the number of cars per lane.

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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Average Delay (sec/veh):     13.1       Worst Case Level Of Service: F[718.5]
******************************************************************************
Street Name:         Brentwood Blvd.                    Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21 1424     0     0 1458    71    27    0    28     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21 1424     0     0 1458    71    27    0    28     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21 1424     0     0 1458    71    27    0    28     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   21 1424     0     0 1458    71    27    0    28     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1529 xxxx xxxxx  xxxx xxxx xxxxx  2960 2960  1494  xxxx xxxx xxxxx
Potent Cap.:  441 xxxx xxxxx  xxxx xxxx xxxxx    16   15   153  xxxx xxxx xxxxx
Move Cap.:    441 xxxx xxxxx  xxxx xxxx xxxxx    16   14   153  xxxx xxxx xxxxx
Volume/Cap:  0.05 xxxx  xxxx  xxxx xxxx  xxxx  1.72 0.00  0.18  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del: 13.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   29 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  6.5 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  719 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    F     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx             718.5            xxxxxx
ApproachLOS:        *                 *                 F                *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.6       Worst Case Level Of Service: F[197.6]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1466    18    15 1534     0     0    0     0     4    0     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1466    18    15 1534     0     0    0     0     4    0     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0 1466    18    15 1534     0     0    0     0     4    0     4
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0 1466    18    15 1534     0     0    0     0     4    0     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1484 xxxx xxxxx  xxxx xxxx xxxxx  3039 3039  1475
Potent Cap.: xxxx xxxx xxxxx   459 xxxx xxxxx  xxxx xxxx xxxxx    14   13   157
Move Cap.:   xxxx xxxx xxxxx   459 xxxx xxxxx  xxxx xxxx xxxxx    14   13   157
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  0.28 0.00  0.03
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  13.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   26 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.9 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  198 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx             197.6
ApproachLOS:        *                 *                 *                 F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         1.295
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 Level Of Service:                   F
********************************************************************************
Street Name:         Brentwood Blvd.              Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10   10     4   10   10     4    4    4     4    4    4
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     121 1069   238   178 1385    89    61   44   101   329   68   245
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  121 1069   238   178 1385    89    61   44   101   329   68   245
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   121 1069   238   178 1385    89    61   44   101   329   68   245
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  121 1069   238   178 1385    89    61   44   101   329   68   245
RTOR Reduct:    0    0   238     0    0     0     0    0     0     0    0   178
RTOR Vol:     121 1069     0   178 1385    89    61   44   101   329   68    67
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  121 1069     0   178 1385    89    61   44   101   329   68    67
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 0.94  0.06  1.00 0.30  0.70  0.83 0.17  1.00
Final Sat.:  1650 1650  1650  1650 1550   100  1650  501  1149  1367  283  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.65  0.00  0.11 0.89  0.89  0.04 0.09  0.09  0.24 0.24  0.04
Crit Volume:  121                 1474                    145        397
Crit Moves:  ****                 ****                   ****       ****
********************************************************************************
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                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Average Delay (sec/veh):      5.4       Worst Case Level Of Service: F[ 92.2]
********************************************************************************
Street Name:         Brentwood Blvd.                     Sunset Ct.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1263   177     7 1253     0     0    0     0     0    0   166
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1263   177     7 1253     0     0    0     0     0    0   166
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1263   177     7 1253     0     0    0     0     0    0   166
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1263   177     7 1253     0     0    0     0     0    0   166
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1440 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  1352
Potent Cap.: xxxx xxxx xxxxx   477 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   186
Move Cap.:   xxxx xxxx xxxxx   477 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   186
Volume/Cap:  xxxx xxxx  xxxx  0.01 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.89
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   6.8
Control Del:xxxxx xxxx xxxxx  12.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  92.2
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     F
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              92.2
ApproachLOS:        *                *                *                   F
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
******************************************************************************
Average Delay (sec/veh):      3.2       Worst Case Level Of Service: F[192.1]
******************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      19 1335    28    24 1325    20     0    0    22    25    0    17
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   19 1335    28    24 1325    20     0    0    22    25    0    17
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    19 1335    28    24 1325    20     0    0    22    25    0    17
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   19 1335    28    24 1325    20     0    0    22    25    0    17
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1345 xxxx xxxxx  1363 xxxx xxxxx  xxxx xxxx   673  2084 2766  1335
Potent Cap.:  519 xxxx xxxxx   511 xxxx xxxxx  xxxx xxxx   459    39   20   190
Move Cap.:    519 xxxx xxxxx   511 xxxx xxxxx  xxxx xxxx   459    35   18   190
Volume/Cap:  0.04 xxxx  xxxx  0.05 xxxx  xxxx  xxxx xxxx  0.05  0.71 0.00  0.09
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx   0.2  xxxx xxxx xxxxx
Control Del: 12.2 xxxx xxxxx  12.4 xxxx xxxxx xxxxx xxxx  13.2 xxxxx xxxx xxxxx
LOS by Move:   B    *     *     B    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   52 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  3.4 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  192 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:    xxxxxx            xxxxxx             13.2            192.1
ApproachLOS:        *                 *                B               F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Brentwood Blvd. @ Applewood Common
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.453
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        34                Level Of Service:                   A
******************************************************************************
Street Name:         Brentwood Blvd.                  Applewood Common
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     4    8     8     4    8     8     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21 1312    48    25 1311    14    12    0    23    58    5    28
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   21 1312    48    25 1311    14    12    0    23    58    5    28
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    21 1312    48    25 1311    14    12    0    23    58    5    28
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   21 1312    48    25 1311    14    12    0    23    58    5    28
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    25
RTOR Vol:      21 1312    48    25 1311    14    12    0    23    58    5     3
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   21 1312    48    25 1311    14    12    0    23    58    5     3
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.93  0.07  1.00 1.98  0.02  1.00 0.00  1.00  0.92 0.08  1.00
Final Sat.:  1720 3319   121  1720 3404    36  1720    0  1720  1583  137  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.40  0.40  0.01 0.39  0.39  0.01 0.00  0.01  0.04 0.04  0.00
Crit Volume:             680    25               12                     63
Crit Moves:             ****  ****             ****                   ****
******************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.936
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E

Street Name:	Brentwood Blvd.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																														
Base Vol:	265	883	163		223	1049		283	283	103		190	333	169		331
Growth Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	265	883	163		223	1049		283	283	103		190	333	169		331
User Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	265	883	163		223	1049		283	283	103		190	333	169		331
Reduct Vol:	0	0	0		0	0		0	0	0		0	0	0		0
Reduced Vol:	265	883	163		223	1049		283	283	103		190	333	169		331
RTOR Reduct:	0	0	0		0	0		0	0	0		0	0	0		0
RTOR Vol:	265	883	163		223	1049		283	283	103		190	333	169		331
PCE Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
FinalVolume:	265	883	163		223	1049		283	283	103		190	333	169		331
Saturation Flow Module:																														
Sat/Lane:	1650	1650	1650		1650	1650		1650	1650	1650		1650	1650	1650		1650
Adjustment:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Lanes:	1.00	1.69	0.31		1.00	1.58		0.42	1.00	1.00		1.00	1.00	1.00		1.00
Final Sat.:	1650	2786	514		1650	2599		701	1650	1650		1650	1650	1650		1650
Capacity Analysis Module:																														
Vol/Sat:	0.16	0.32	0.32		0.14	0.40		0.40	0.17	0.06		0.12	0.20	0.10		0.20
Crit Volume:	265					666			283							331
Crit Moves:	****					****			****							****

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #10 Brentwood Blvd. @ Technology Way

Cycle (sec): 100 Critical Vol./Cap.(X): 0.627
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 61 Level Of Service: B

Street Name:	Brentwood Blvd.								Technology Way							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	6	6			0	6	6			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																														
Base Vol:	42	1128	54		82	1377		21	41	0		63	81	0		109
Growth Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	42	1128	54		82	1377		21	41	0		63	81	0		109
User Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	42	1128	54		82	1377		21	41	0		63	81	0		109
Reduct Vol:	0	0	0		0	0		0	0	0		0	0	0		0
Reduced Vol:	42	1128	54		82	1377		21	41	0		63	81	0		109
RTOR Reduct:	0	0	0		0	0		0	0	0		0	0	0		0
RTOR Vol:	42	1128	54		82	1377		21	41	0		63	81	0		109
PCE Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
FinalVolume:	42	1128	54		82	1377		21	41	0		63	81	0		109
Saturation Flow Module:																														
Sat/Lane:	1650	1650	1650		1650	1650		1650	1650	1650		1650	1650	1650		1650
Adjustment:	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Lanes:	1.00	1.91	0.09		1.00	1.97		0.03	0.39	0.00		0.61	0.43	0.00		0.57
Final Sat.:	1650	3149	151		1650	3250		50	650	0		1000	703	0		947
Capacity Analysis Module:																														
Vol/Sat:	0.03	0.36	0.36		0.05	0.42		0.42	0.06	0.00		0.06	0.12	0.00		0.12
Crit Volume:	42					699						104				190
Crit Moves:	****					****						****				****

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------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
******************************************************************************
Average Delay (sec/veh):      5.1       Worst Case Level Of Service: F[139.9]
******************************************************************************
Street Name:         Brentwood Blvd.                    Village Drive
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1052    65    58 1395     0     0     0     0    47     0    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1052    65    58 1395     0     0     0     0    47     0    46
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1052    65    58 1395     0     0     0     0    47     0    46
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1052    65    58 1395     0     0     0     0    47     0    46
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8  6.5   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1117 xxxx xxxxx  xxxx xxxx xxxxx  1898 2596   559
Potent Cap.: xxxx xxxx xxxxx   633 xxxx xxxxx  xxxx xxxx xxxxx    63   25   478
Move Cap.:   xxxx xxxx xxxxx   633 xxxx xxxxx  xxxx xxxx xxxxx    58   23   478
Volume/Cap:  xxxx xxxx  xxxx  0.09 xxxx  xxxx  xxxx xxxx  xxxx  0.81 0.00  0.10
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     B    *     *     *     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  103 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  5.3 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  140 xxxxx
Shared LOS:    *    *     *     *    *     *     *     *     *     *     F     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx            139.9
ApproachLOS:        *                 *                 *                 F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.605
Loss Time (sec):       9 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        47                Level Of Service:                   B
******************************************************************************
Street Name:         Brentwood Blvd.          Central Blvd / Sycamore Ave (S)
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   15    15     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      39  765    38   138 1108   170   261  158    89    33   59   109
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   39  765    38   138 1108   170   261  158    89    33   59   109
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    39  765    38   138 1108   170   261  158    89    33   59   109
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   39  765    38   138 1108   170   261  158    89    33   59   109
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   109
RTOR Vol:      39  765    38   138 1108   170   261  158    89    33   59     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   39  765    38   138 1108   170   261  158    89    33   59     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.91  0.09  1.00 1.73  0.27  1.00 1.28  0.72  1.00 1.00  1.00
Final Sat.:  1650 3144   156  1650 2861   439  1650 2111  1189  1650 1650  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.24  0.24  0.08 0.39  0.39  0.16 0.07  0.07  0.02 0.04  0.00
Crit Volume:   39                    639         261                     59
Crit Moves:  ****                 ****        ****                    ****
******************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 O'hara Ave. @ Sand Creek Rd.

Cycle (sec): 100 | Critical Vol./Cap.(X): 0.645
Loss Time (sec): 12 (Y+R=4.0 sec) | Average Delay (sec/veh): xxxxxx
Optimal Cycle: 64 | Level Of Service: B

Street Name:	O'hara Ave.								Sand Creek Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	4	4	4		4	4	4		4	4	4		4	4	4	
Lanes:	1	0	1	0 1	1	0	2	0 1	1	0	2	0 2	1	0	2	0 1
Volume Module:																
Base Vol:	378	340	185		120	370	245		170	510	288		154	663	91	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	378	340	185		120	370	245		170	510	288		154	663	91	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	378	340	185		120	370	245		170	510	288		154	663	91	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	378	340	185		120	370	245		170	510	288		154	663	91	
RTOR Reduct:	0	0	154		0	0	170		0	0	288		0	0	91	
RTOR Vol:	378	340	31		120	370	75		170	510	0		154	663	0	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	378	340	31		120	370	75		170	510	0		154	663	0	
Saturation Flow Module:																
Sat/Lane:	1650	1650	1650		1650	1650	1650		1650	1650	1650		1650	1650	1650	
Adjustment:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	0.91		1.00	1.00	1.00	
Lanes:	1.00	1.00	1.00		1.00	2.00	1.00		1.00	2.00	2.00		1.00	2.00	1.00	
Final Sat.:	1650	1650	1650		1650	3300	1650		1650	3300	3000		1650	3300	1650	
Capacity Analysis Module:																
Vol/Sat:	0.23	0.21	0.02		0.07	0.11	0.05		0.10	0.15	0.00		0.09	0.20	0.00	
Crit Volume:	378					185			170					332		
Crit Moves:	****					****			****					****		

Scenario Report

Scenario:	CUM + PP AM
Command:	Default
Volume:	CUM + PP AM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	No / No	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

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--------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   12 1242     0     0 1168    10    14    0    17     0    0     0
ApproachDel:    xxxxxx           xxxxxx            102.7           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.9]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=31]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2463]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



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--------------------------------------------------------------------------------
                  Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   12 1242     0     0 1168    10    14    0    17     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2432
Minor Approach Volume:           31
Minor Approach Volume Threshold: -21 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	10	1244			0	0	1170			8	14			0	17	0			0	0
ApproachDel:	xxxxxx					xxxxxx					102.2					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.9]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=31]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2463]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	10	1244			0	0	1170			8	14			0	17	0			0	0

Major Street Volume: 2432
Minor Approach Volume: 31
Minor Approach Volume Threshold: -21 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Delay Signal Warrant Report

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	1221		31	31	1175		0	0		0	0	11		0	21
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				88.7			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.8]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=32]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2490]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Brentwood Blvd. @ Homecoming Way

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	1!	0 0
Initial Vol:	0	1221		31	31	1175		0	0		0	0	11		0	21

Major Street Volume: 2458
Minor Approach Volume: 32
Minor Approach Volume Threshold: -25 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Delay Signal Warrant Report

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	882		177	16	1207		0	0		0	0	0		0	70
ApproachDel:	xxxxxx				xxxxxx				xxxxxx				20.0			

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=70]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2352]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Brentwood Blvd. @ Sunset Ct.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Lanes:	0	0	0	1 0	1	0	1	0 0	0	0	0	0 0	0	0	0	0 1
Initial Vol:	0	882		177	16	1207		0	0		0	0	0		0	70

Major Street Volume: 2282
Minor Approach Volume: 70
Minor Approach Volume Threshold: 1 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   15  947    31    19 1178    18    14    1    29    24    2    23
ApproachDel:    xxxxxx           xxxxxx            112.6             59.3
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=44]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2301]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.8]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=49]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2301]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   15  947    31    19 1178    18    14    1    29    24    2    23
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2208
Minor Approach Volume:           49
Minor Approach Volume Threshold: 12 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1056    37    22  871     0     0     0     0    22     0    33
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             30.4
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=55]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2041]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #11 Brentwood Blvd. @ Village Drive
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  1  0    1  0  2  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1056    37    22  871     0     0     0     0    22     0    33
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1986
Minor Approach Volume:           55
Minor Approach Volume Threshold: 48 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Scenario Report

Scenario:	CUM + PP PM
Command:	Default
Volume:	CUM + PP PM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	NONE
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Signal Warrant Summary Report

Intersection	Base Met [Del / Vol]	Future Met [Del / Vol]
# 2 Brentwood Blvd. @ Sunrise Drive	No / No	??? / ???
# 3 Brentwood Blvd. @ Gregory Lane	No / No	??? / ???
# 4 Brentwood Blvd. @ Homecoming Way	No / No	??? / ???
# 6 Brentwood Blvd. @ Sunset Ct.	Yes / Yes	??? / ???
# 7 Brentwood Blvd. @ Havenwood Ave.	No / No	??? / ???
# 11 Brentwood Blvd. @ Village Drive	No / No	??? / ???

Peak Hour Delay Signal Warrant Report

****

Intersection #2 Brentwood Blvd. @ Sunrise Drive

****

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	32	1413			0		0	1496		33	29			0	26		0		0	0
ApproachDel:	xxxxxx					xxxxxx					854.1					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=13.0]

SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=55]

FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=3][total volume=3029]

SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #2 Brentwood Blvd. @ Sunrise Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	32	1413			0	0	1496			33	29			0	26	0			0	0

Major Street Volume: 2974
Minor Approach Volume: 55
Minor Approach Volume Threshold: -91 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Peak Hour Delay Signal Warrant Report

Intersection #3 Brentwood Blvd. @ Gregory Lane

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0	1!	0	0	0	0	0	0	0
Initial Vol:	21	1424			0	0	1458			71	27			0	28	0			0	0
ApproachDel:	xxxxxx					xxxxxx					718.5					xxxxxx				

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=11.0]
SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=55]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3029]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   21 1424     0     0 1458    71    27    0    28     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2974
Minor Approach Volume:           55
Minor Approach Volume Threshold: -91 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1466    18    15 1534     0     0    0     0     4    0     4
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            197.6
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=8]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3041]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

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--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
Initial Vol:    0 1466    18    15 1534     0     0     0     0     4     0     4
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3033
Minor Approach Volume:           8
Minor Approach Volume Threshold: -97 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0 1263   177     7 1253     0     0     0     0     0     0   166
ApproachDel:    xxxxxx           xxxxxx           xxxxxx              92.2
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=4.2]
   SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=166]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2866]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

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--------------------------------------------------------------------------------
                 Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 Brentwood Blvd. @ Sunset Ct.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
Initial Vol:    0 1263   177     7 1253     0     0    0     0     0    0   166
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             2700
Minor Approach Volume:           166
Minor Approach Volume Threshold: -57 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
********************************************************************************
Base Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   19 1335    28    24 1325    20     7    1    14    25    0    17
ApproachDel:    xxxxxx           xxxxxx            281.4            200.6
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=22]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2815]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=2.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=42]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=2815]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #7 Brentwood Blvd. @ Havenwood Ave.

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	1	0	1	0	1	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Initial Vol:	19	1335			28	24	1325			20	7		1		14	25		0		17

Major Street Volume: 2751
Minor Approach Volume: 42
Minor Approach Volume Threshold: -64 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Delay Signal Warrant Report

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0	1052			65	58	1395			0	0		0		0	47		0		46
ApproachDel:	xxxxxx					xxxxxx					xxxxxx					139.9				

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=3.6]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=93]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=2663]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #11 Brentwood Blvd. @ Village Drive

Base Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1!	0	0
Initial Vol:	0	1052			65	58	1395			0	0		0		0	47		0		46

Major Street Volume: 2570
Minor Approach Volume: 93
Minor Approach Volume Threshold: -40 [less than minimum of 100]

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

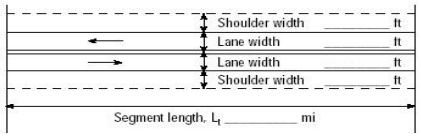
The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*AM Peak*	Analysis Year	*Cumulative plus Project*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1984* veh/h
Directional split	*51 / 49*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*2185*
v_p * highest directional split proportion[2] (pc/h)	*1114*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.1*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*16.9*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*2180*
v_p * highest directional split proportion[2] (pc/h)	*1112*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*85.3*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*3.8*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*89.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*E*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.68*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*109*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*397*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*6.4*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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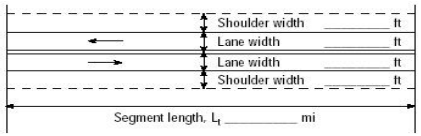
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst		Highway	*Lone Tree Way*
Agency or Company	*Kimley-Horn and Assoc., Inc.*	From/To	*West of Brentwood Blvd.*
Date Performed	*11/14/2008*	Jurisdiction	*City of Brentwood*
Analysis Time Period	*PM Peak*	Analysis Year	*Cumulative plus Project*

Project Description:

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*2444* veh/h
Directional split	*52 / 48*
Peak-hour factor, PHF	*0.91*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*30*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*2691*
v_p * highest directional split proportion[2] (pc/h)	*1399*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*35 mi/h*	Base free-flow speed, $BFFS_{FM}$	*mi/h*
Observed volume, V_f	*0 veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*35.0 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.0*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*13.2*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*
Two-way flow rate[1], v_p (pc/h) $v_p=V/(PHF * f_G * f_{HV})$	*2686*
v_p * highest directional split proportion[2] (pc/h)	*1397*
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	*90.6*
Adj. for directional distribution and no-passing zone, $f_{d/np}$(%)(Exh. 20-12)	*2.2*
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	*92.8*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*E*
Volume to capacity ratio v/c $v/c=V_p/3{,}200$	*0.84*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*) $VMT_{15}=0.25L_t(V/PHF)$	*134*

Peak-hour vehicle-miles of travel, VMT_{60} (veh- *mi*) $VMT_{60}=V*L_t$	*489*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}=VMT_{15}/ATS$	*10.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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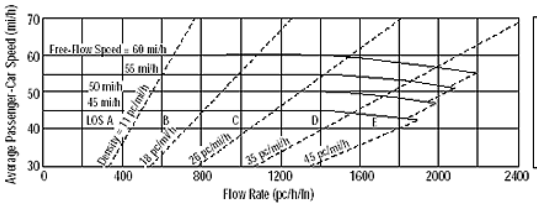
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1186	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	662
Speed, S (mi/h)	45.0
D (pc/mi/ln)	14.7
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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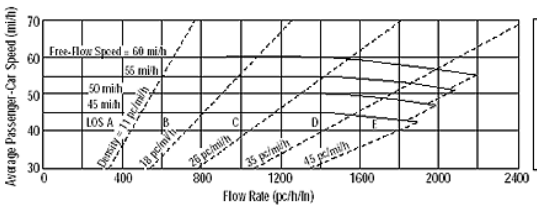
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1227	Peak-Hour Factor, PHF	0.94
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	685
Speed, S (mi/h)	45.0
D (pc/mi/ln)	15.2
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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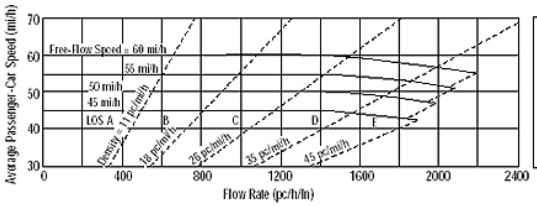
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1496	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	844
Speed, S (mi/h)	45.0
D (pc/mi/ln)	18.8
LOS	C

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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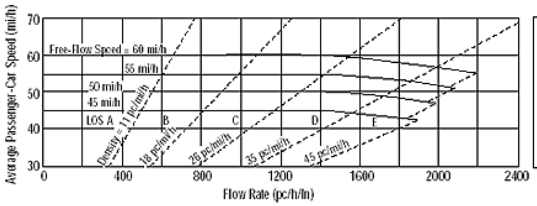
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	North of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1555	Peak-Hour Factor, PHF	0.93
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	877
Speed, S (mi/h)	45.0
D (pc/mi/ln)	19.5
LOS	C

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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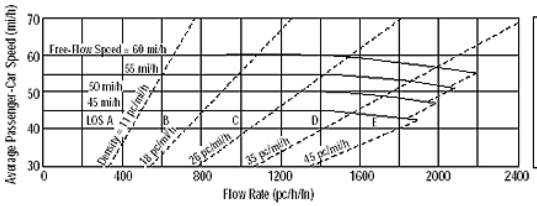
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	505	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	301
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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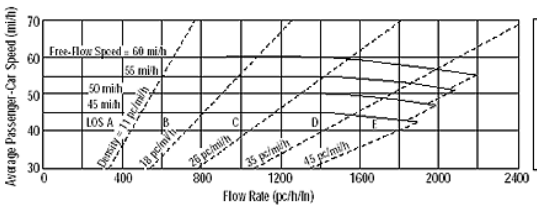
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	C
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	458	Peak-Hour Factor, PHF	0.88
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	273
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.1
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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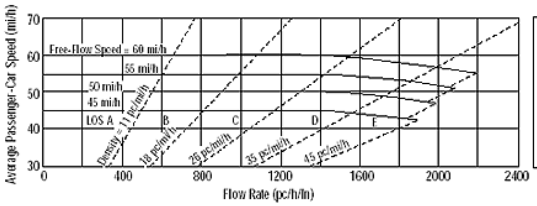
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	576	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	332
Speed, S (mi/h)	45.0
D (pc/mi/ln)	7.4
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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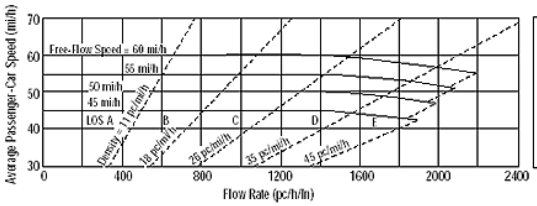
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Sand Creek (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	717	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	413
Speed, S (mi/h)	45.0
D (pc/mi/ln)	9.2
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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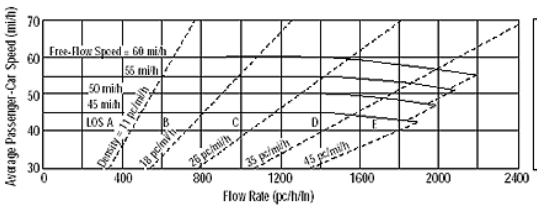
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1238	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	670
Speed, S (mi/h)	45.0
D (pc/mi/ln)	14.9
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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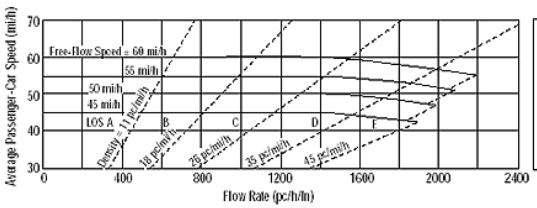
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	928	Peak-Hour Factor, PHF	0.97
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	502
Speed, S (mi/h)	45.0
D (pc/mi/ln)	11.2
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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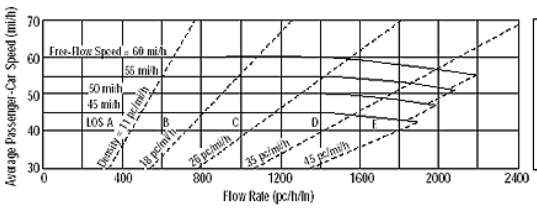
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (NB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1258	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	10
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	725
Speed, S (mi/h)	45.0
D (pc/mi/ln)	16.1
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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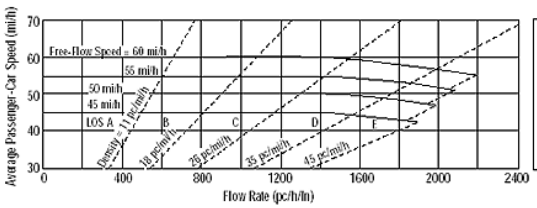
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Brentwood Blvd. (SB)
From/To	South of Sand Creek Rd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1567	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	20
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	904
Speed, S (mi/h)	45.0
D (pc/mi/ln)	20.1
LOS	C

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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Appendix G:

Analysis Worksheets for Mitigated Conditions

```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
******************************************************************************
Average Delay (sec/veh):      0.2       Worst Case Level Of Service: B[ 14.5]
******************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  811     7   31 1047     0     0     0     0     0     0     1
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  811     7   31 1047     0     0     0     0     0     0     1
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  811     7   31 1047     0     0     0     0     0     0     1
Reduct Vol:     0    0     0    0    0     0     0     0     0     0     0     0
FinalVolume:    0  811     7   31 1047     0     0     0     0     0     0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   818 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   815
Potent Cap.: xxxx xxxx xxxxx   819 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   381
Move Cap.:   xxxx xxxx xxxxx   819 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   381
Volume/Cap:  xxxx xxxx  xxxx  0.04 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.0
Control Del:xxxxx xxxx xxxxx   9.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  14.5
LOS by Move:   *    *     *     A    *     *     *     *     *     *     *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *     *     *     *     *     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              14.5
ApproachLOS:        *                 *                 *                  B
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
******************************************************************************
Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.607
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        58                Level Of Service:                   B
******************************************************************************
Street Name:         Brentwood Blvd.              Grant Street / Sunset Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     4   10    10     4   10    10     4    4     4     4    4     4
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      86  566   226   152  831    60   101   42   149   219   44   149
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   86  566   226   152  831    60   101   42   149   219   44   149
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    86  566   226   152  831    60   101   42   149   219   44   149
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   86  566   226   152  831    60   101   42   149   219   44   149
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   149
RTOR Vol:      86  566   226   152  831    60   101   42   149   219   44     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   86  566   226   152  831    60   101   42   149   219   44     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.43  0.57  1.00 1.87  0.13  1.00 0.22  0.78  0.83 0.17  1.00
Final Sat.:  1650 2358   942  1650 3078   222  1650  363  1287  1374  276  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.24  0.24  0.09 0.27  0.27  0.06 0.12  0.12  0.16 0.16  0.00
Crit Volume:        396          152                          191         263
Crit Moves:       ****         ****                         ****        ****
******************************************************************************
```

```
----------------------------------------------------------------------------
----------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
****************************************************************************
Intersection #7 Brentwood Blvd. @ Havenwood Ave.
****************************************************************************
Average Delay (sec/veh):      0.7       Worst Case Level Of Service: C[ 16.3]
****************************************************************************
Street Name:         Brentwood Blvd.                    Havenwood Ave.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  1    1  0  1  1  0    0  0  0  0  1    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15  863    21    11 1178    18     0    0    43     0    0    38
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   15  863    21    11 1178    18     0    0    43     0    0    38
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    15  863    21    11 1178    18     0    0    43     0    0    38
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   15  863    21    11 1178    18     0    0    43     0    0    38
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1196 xxxx xxxxx   884 xxxx xxxxx  xxxx xxxx   598  xxxx xxxx   863
Potent Cap.:  591 xxxx xxxxx   774 xxxx xxxxx  xxxx xxxx   506  xxxx xxxx   357
Move Cap.:    591 xxxx xxxxx   774 xxxx xxxxx  xxxx xxxx   506  xxxx xxxx   357
Volume/Cap:  0.03 xxxx  xxxx  0.01 xxxx  xxxx  xxxx xxxx  0.08  xxxx xxxx  0.11
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx   0.3  xxxx xxxx   0.4
Control Del: 11.3 xxxx xxxxx   9.7 xxxx xxxxx xxxxx xxxx  12.8 xxxxx xxxx  16.3
LOS by Move:   B    *     *     A    *     *     *    *     B     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx              12.8              16.3
ApproachLOS:        *                 *                 B                 C
****************************************************************************
Note: Queue reported is the number of cars per lane.
****************************************************************************
```



```
----------------------------------------------------------------------------
----------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
****************************************************************************
Intersection #4 Brentwood Blvd. @ Homecoming Way
****************************************************************************
Average Delay (sec/veh):      0.1       Worst Case Level Of Service: C[ 21.2]
****************************************************************************
Street Name:         Brentwood Blvd.                    Homecoming Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1194    18    15 1074     0     0    0     0     0    0     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1194    18    15 1074     0     0    0     0     0    0     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0 1194    18    15 1074     0     0    0     0     0    0     4
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0 1194    18    15 1074     0     0    0     0     0    0     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1212 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  1203
Potent Cap.: xxxx xxxx xxxxx   583 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   227
Move Cap.:   xxxx xxxx xxxxx   583 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   227
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.1
Control Del:xxxxx xxxx xxxxx  11.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  21.2
LOS by Move:   *    *     *     B    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx              21.2
ApproachLOS:        *                 *                 *                 C
****************************************************************************
Note: Queue reported is the number of cars per lane.
****************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.774
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 101 Level Of Service: C

Street Name:	Brentwood Blvd.									Grant Street / Sunset Rd.								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	0	1	0	0	1	0	0	1
Volume Module:																				
Base Vol:	121	904	238		178	795		89		61	43		101	331		53	245			
Growth Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Initial Bse:	121	904	238		178	795		89		61	43		101	331		53	245			
User Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Volume:	121	904	238		178	795		89		61	43		101	331		53	245			
Reduct Vol:	0	0	0		0	0		0		0	0		0	0		0	0			
Reduced Vol:	121	904	238		178	795		89		61	43		101	331		53	245			
RTOR Reduct:	0	0	0		0	0		0		0	0		0	0		0	178			
RTOR Vol:	121	904	238		178	795		89		61	43		101	331		53	67			
PCE Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
MLF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
FinalVolume:	121	904	238		178	795		89		61	43		101	331		53	67			
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650		1650	1650		1650		1650	1650		1650	1650		1650	1650			
Adjustment:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Lanes:	1.00	1.58	0.42		1.00	1.80		0.20		1.00	0.30		0.70	0.86		0.14	1.00			
Final Sat.:	1650	2612	688		1650	2968		332		1650	493		1157	1422		228	1650			
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.35	0.35		0.11	0.27		0.27		0.04	0.09		0.09	0.23		0.23	0.04			
Crit Volume:		571			178						144					384				
Crit Moves:		****			****						****					****				

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #11 Brentwood Blvd. @ Village Drive

Average Delay (sec/veh): 0.5 Worst Case Level Of Service: B[12.9]

Street Name:	Brentwood Blvd.									Village Drive								
Approach:	North Bound					South Bound				East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1
Volume Module:																				
Base Vol:	0	995		50		58	1159		0		0		0		0	0		0		46
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	0	995		50		58	1159		0		0		0		0	0		0		46
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Volume:	0	995		50		58	1159		0		0		0		0	0		0		46
Reduct Vol:	0	0		0		0	0		0		0		0		0	0		0		0
FinalVolume:	0	995		50		58	1159		0		0		0		0	0		0		46
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx		4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx			6.9				
FollowUpTim:	xxxxx	xxxx	xxxxx		2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx			3.3				
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx		1045	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx			523					
Potent Cap.:	xxxx	xxxx	xxxxx		673	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx			504					
Move Cap.:	xxxx	xxxx	xxxxx		673	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx			504					
Volume/Cap:	xxxx	xxxx	xxxx		0.09	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx			0.09					
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx		0.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx			0.3					
Control Del:	xxxxx	xxxx	xxxxx		10.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx			12.9					
LOS by Move:	*	*	*		B	*	*	*	*	*	*	*			B					
Movement:	LT - LTR - RT					LT - LTR - RT					LT - LTR - RT					LT - LTR - RT				
Shared Cap.:	xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx			xxxxx					
SharedQueue:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx			xxxxx					
Shrd ConDel:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx			xxxxx					
Shared LOS:	*	*	*		*	*	*	*	*	*	*	*			*					
ApproachDel:	xxxxxx				xxxxxx				xxxxxx						12.9					
ApproachLOS:	*				*				*						B					

Note: Queue reported is the number of cars per lane.

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #12 Brentwood Blvd. @ Central Blvd / Sycamore Ave (S)

Cycle (sec): 100 Critical Vol./Cap.(X): 0.478
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 36 Level Of Service: A

Street Name:	Brentwood Blvd.									Central Blvd / Sycamore Ave (S)								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	4	15	15			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	0	1
Volume Module:																				
Base Vol:	39	765	38			114	905	170			153	77	37			61	59	109		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	39	765	38			114	905	170			153	77	37			61	59	109		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	39	765	38			114	905	170			153	77	37			61	59	109		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	39	765	38			114	905	170			153	77	37			61	59	109		
RTOR Reduct:	0	0	0			0	0	0			0	0	0			0	0	109		
RTOR Vol:	39	765	38			114	905	170			153	77	37			61	59	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	39	765	38			114	905	170			153	77	37			61	59	0		
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	1.91	0.09			1.00	1.68	0.32			1.00	1.35	0.65			1.00	1.00	1.00		
Final Sat.:	1650	3144	156			1650	2778	522			1650	2229	1071			1650	1650	1650		
Capacity Analysis Module:																				
Vol/Sat:	0.02	0.24	0.24			0.07	0.33	0.33			0.09	0.03	0.03			0.04	0.04	0.00		
Crit Volume:	39						538				153						59			
Crit Moves:	****						****				****						****			

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #1 Brentwood Blvd @ Lone Tree Way (S)

Cycle (sec): 100 Critical Vol./Cap.(X): 0.826
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 131 Level Of Service: D

Street Name:	Brentwood Blvd									Lone Tree Way (S)								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Ovl					Include				
Min. Green:	4	8	8			4	8	8			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	0	1	0	0	1	0	1	0	0	1
Volume Module:																				
Base Vol:	636	542	77			41	609	322			325	49	636			32	17	14		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	636	542	77			41	609	322			325	49	636			32	17	14		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	636	542	77			41	609	322			325	49	636			32	17	14		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	636	542	77			41	609	322			325	49	636			32	17	14		
RTOR Reduct:	0	0	32			0	0	322			0	0	636			0	0	14		
RTOR Vol:	636	542	45			41	609	0			325	49	0			32	17	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	636	542	45			41	609	0			325	49	0			32	17	0		
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650			1650	1650	1650			1650	1650	1650			1650	1650	1650		
Adjustment:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Lanes:	1.00	1.00	1.00			1.00	2.00	1.00			0.87	0.13	1.00			0.65	0.35	1.00		
Final Sat.:	1650	1650	1650			1650	3300	1650			1434	216	1650			1078	572	1650		
Capacity Analysis Module:																				
Vol/Sat:	0.39	0.33	0.03			0.02	0.18	0.00			0.23	0.23	0.00			0.03	0.03	0.00		
Crit Volume:	636						305				374						49			
Crit Moves:	****						****				****						****			

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.

Cycle (sec): 100 | Critical Vol./Cap.(X): 0.678
Loss Time (sec): 12 (Y+R=4.0 sec) | Average Delay (sec/veh): xxxxxx
Optimal Cycle: 71 | Level Of Service: B

Street Name:	Brentwood Blvd.								Grant Street / Sunset Rd.							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Include					Include				
Min. Green:	4	10	10			4	10	10			4	4	4			4	4	4		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	0	1	0	0	1	0	0	1
Volume Module:																				
Base Vol:	86	743	226		152	1030		77		101	42		149	218		71	149			
Growth Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Initial Bse:	86	743	226		152	1030		77		101	42		149	218		71	149			
User Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Volume:	86	743	226		152	1030		77		101	42		149	218		71	149			
Reduct Vol:	0	0	0		0	0		0		0	0		0	0		0	0			
Reduced Vol:	86	743	226		152	1030		77		101	42		149	218		71	149			
RTOR Reduct:	0	0	0		0	0		0		0	0		0	0		0	149			
RTOR Vol:	86	743	226		152	1030		77		101	42		149	218		71	0			
PCE Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
MLF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
FinalVolume:	86	743	226		152	1030		77		101	42		149	218		71	0			
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650		1650	1650		1650		1650	1650		1650	1650		1650	1650			
Adjustment:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Lanes:	1.00	1.53	0.47		1.00	1.86		0.14		1.00	0.22		0.78	0.75		0.25	1.00			
Final Sat.:	1650	2530	770		1650	3070		230		1650	363		1287	1245		405	1650			
Capacity Analysis Module:																				
Vol/Sat:	0.05	0.29	0.29		0.09	0.34		0.34		0.06	0.12		0.12	0.18		0.18	0.00			
Crit Volume:	86					554							191			289				
Crit Moves:	****					****							****			****				

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #1 Brentwood Blvd @ Lone Tree Way (S)

Cycle (sec): 100 | Critical Vol./Cap.(X): 1.028
Loss Time (sec): 12 (Y+R=4.0 sec) | Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 | Level Of Service: F

Street Name:	Brentwood Blvd								Lone Tree Way (S)							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Split Phase					Split Phase				
Rights:	Include					Include					Ovl					Include				
Min. Green:	4	8	8			4	8	8			4	4	4			4	4	4		
Lanes:	1	0	1	0	1	1	0	2	0	1	0	1	0	0	1	0	1	0	0	1
Volume Module:																				
Base Vol:	759	710	41		22	627		486		468	26		676	100		29	35			
Growth Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Initial Bse:	759	710	41		22	627		486		468	26		676	100		29	35			
User Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
PHF Volume:	759	710	41		22	627		486		468	26		676	100		29	35			
Reduct Vol:	0	0	0		0	0		0		0	0		0	0		0	0			
Reduced Vol:	759	710	41		22	627		486		468	26		676	100		29	35			
RTOR Reduct:	0	0	41		0	0		468		0	0		676	0		0	22			
RTOR Vol:	759	710	0		22	627		18		468	26		0	100		29	13			
PCE Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
MLF Adj:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
FinalVolume:	759	710	0		22	627		18		468	26		0	100		29	13			
Saturation Flow Module:																				
Sat/Lane:	1650	1650	1650		1650	1650		1650		1650	1650		1650	1650		1650	1650			
Adjustment:	1.00	1.00	1.00		1.00	1.00		1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Lanes:	1.00	1.00	1.00		1.00	2.00		1.00		0.95	0.05		1.00	0.78		0.22	1.00			
Final Sat.:	1650	1650	1650		1650	3300		1650		1563	87		1650	1279		371	1650			
Capacity Analysis Module:																				
Vol/Sat:	0.46	0.43	0.00		0.01	0.19		0.01		0.30	0.30		0.00	0.08		0.08	0.01			
Crit Volume:	759					314					494					129				
Crit Moves:	****					****					****					****				

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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Brentwood Blvd. @ Sunrise  Drive
******************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: A[  0.0]
******************************************************************************
Street Name:         Brentwood Blvd.                     Sunrise Dr.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  1  0  0    0  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1413     0     0 1496     0     0     0     0     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1413     0     0 1496     0     0     0     0     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1413     0     0 1496     0     0     0     0     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0 1413     0     0 1496     0     0     0     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  1496  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   152  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   152  xxxx xxxx xxxxx
Total Cap:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   180  163 xxxxx   180  163 xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx            xxxxxx            xxxxxx            xxxxxx
ApproachLOS:        *                 *                 *                 *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.923
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):        13.6
Optimal Cycle:       180                Level Of Service:                   B
******************************************************************************
Street Name:         Brentwood Blvd.                     Gregory Ln.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      53 1424     0     0 1458   104    56    0    54     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   53 1424     0     0 1458   104    56    0    54     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    53 1424     0     0 1458   104    56    0    54     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   53 1424     0     0 1458   104    56    0    54     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   53 1424     0     0 1458   104    56    0    54     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 1.00  1.00  1.00 0.99  0.99  0.91 1.00  0.91  1.00 1.00  1.00
Lanes:       1.00 1.00  0.00  0.00 0.93  0.07  0.51 0.00  0.49  0.00 0.00  0.00
Final Sat.:  1805 1900     0     0 1758   125   881    0   849     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.75  0.00  0.00 0.83  0.83  0.06 0.00  0.06  0.00 0.00  0.00
Crit Moves:  ****               ****       ****
Green/Cycle: 0.03 0.93  0.00  0.00 0.90  0.90  0.07 0.00  0.07  0.00 0.00  0.00
Volume/Cap:  0.92 0.80  0.00  0.00 0.92  0.92  0.92 0.00  0.92  0.00 0.00  0.00
Uniform Del: 48.3  0.9   0.0   0.0  3.0   3.0  46.3  0.0  46.3   0.0  0.0   0.0
IncremntDel: 90.7  2.8   0.0   0.0  8.8   8.8  58.7  0.0  58.7   0.0  0.0   0.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  0.00  0.00 1.00  1.00  1.00 0.00  1.00  0.00 0.00  0.00
Delay/Veh:  139.0  3.7   0.0   0.0 11.8  11.8 105.0  0.0 105.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 139.0  3.7   0.0   0.0 11.8  11.8 105.0  0.0 105.0   0.0  0.0   0.0
LOS by Move:   F    A     A     A    B     B     F    A     F     A    A     A
HCM2kAvgQ:      4   15     0     0   34    34     6    0     6     0    0     0
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Base Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   53 1424     0     0 1458   104    56    0    54     0    0     0
ApproachDel:    xxxxxx           xxxxxx           1975.4           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=60.4]
   SUCCEED - Vehicle-hours greater than or equal to 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=110]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3149]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```



```
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
                    Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Brentwood Blvd. @ Gregory Lane
********************************************************************************
Base Volume Alternative: Peak Hour Warrant Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   53 1424     0     0 1458   104    56    0    54     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3039
Minor Approach Volume:           110
Minor Approach Volume Threshold: -98 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #5 Brentwood Blvd. @ Grant Street / Sunset Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.848
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 150 Level Of Service: D

Street Name:	Brentwood Blvd.						Grant Street / Sunset Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	4	10	10	4	10	10	4	4	4	4	4	4
Lanes:	1 0	1	1 0	1 0	1	1 0	1 0	0	1 0	0 1	0	0 1
Volume Module:												
Base Vol:	121	1069	238	178	1385	89	61	44	101	329	68	245
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	121	1069	238	178	1385	89	61	44	101	329	68	245
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	121	1069	238	178	1385	89	61	44	101	329	68	245
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	121	1069	238	178	1385	89	61	44	101	329	68	245
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	178
RTOR Vol:	121	1069	238	178	1385	89	61	44	101	329	68	67
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	121	1069	238	178	1385	89	61	44	101	329	68	67
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.64	0.36	1.00	1.88	0.12	1.00	0.30	0.70	0.83	0.17	1.00
Final Sat.:	1650	2699	601	1650	3101	199	1650	501	1149	1367	283	1650
Capacity Analysis Module:												
Vol/Sat:	0.07	0.40	0.40	0.11	0.45	0.45	0.04	0.09	0.09	0.24	0.24	0.04
Crit Volume:	121					737			145		397	
Crit Moves:	****					****			****		****	

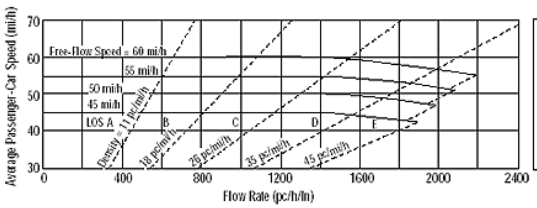
Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #9 Brentwood Blvd. @ Sand Creek Rd.

Cycle (sec): 100 Critical Vol./Cap.(X): 0.851
Loss Time (sec): 9 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 125 Level Of Service: D

Street Name:	Brentwood Blvd.						Sand Creek Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	4	10	10	4	10	10	4	4	4	4	4	4
Lanes:	1 0	1	1 0	1 0	2	0 1	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	265	883	163	223	1049	283	283	103	190	333	169	331
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	265	883	163	223	1049	283	283	103	190	333	169	331
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	265	883	163	223	1049	283	283	103	190	333	169	331
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	265	883	163	223	1049	283	283	103	190	333	169	331
RTOR Reduct:	0	0	0	0	0	283	0	0	0	0	0	0
RTOR Vol:	265	883	163	223	1049	0	283	103	190	333	169	331
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	265	883	163	223	1049	0	283	103	190	333	169	331
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.69	0.31	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1650	2786	514	1650	3300	1650	1650	1650	1650	1650	1650	1650
Capacity Analysis Module:												
Vol/Sat:	0.16	0.32	0.32	0.14	0.32	0.00	0.17	0.06	0.12	0.20	0.10	0.20
Crit Volume:	265				525		283					331
Crit Moves:	****				****		****					****

MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Lone Tree Way (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	975	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	15
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	541
Speed, S (mi/h)	45.0
D (pc/mi/ln)	12.0
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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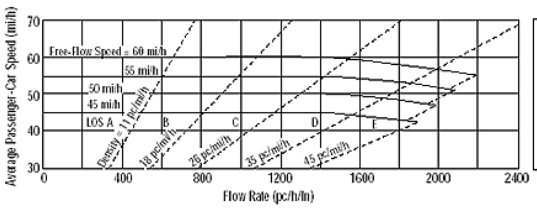
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	AM Peak

Site Information

Highway/Direction to Travel	Lone Tree Way (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1010	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	15
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	560
Speed, S (mi/h)	45.0
D (pc/mi/ln)	12.4
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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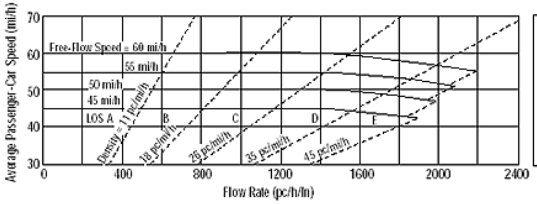
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Lone Tree Way (EB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1274	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	15
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	706
Speed, S (mi/h)	45.0
D (pc/mi/ln)	15.7
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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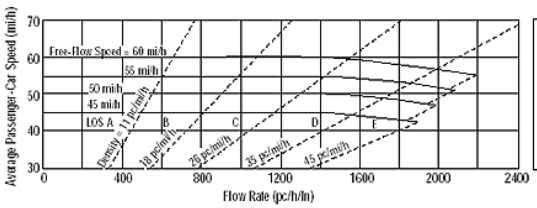
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	O
Operational (LOS)	FFS, N, v_p	L
Design (N)	FFS, LOS, v_p	N
Design (v_p)	FFS, LOS, N	v_p
Planning (LOS)	FFS, N, AADT	L
Planning (N)	FFS, LOS, AADT	N
Planning (v_p)	FFS, LOS, N	v_p

General Information

Analyst	
Agency or Company	Kimley-Horn and Assoc., Inc.
Date Performed	11/14/2008
Analysis Time Period	PM Peak

Site Information

Highway/Direction to Travel	Lone Tree Way (WB)
From/To	West of Brentwood Blvd.
Jurisdiction	City of Brentwood
Analysis Year	Cumulative + Project

Project Description

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1170	Peak-Hour Factor, PHF	0.91
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearence, LC (ft)	12.0
Access Points, A (A/mi)	15
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	649
Speed, S (mi/h)	45.0
D (pc/mi/ln)	14.4
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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APPENDIX E

2/12/2009 10:44:32 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: I:\Projects\Active\Brentwood\Sciortino Ranch\Technical Reports\Air Data\URBEMIS\Sciortino Ranch.urb924

Project Name: Sciortino Ranch

Project Location: Contra Costa County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (tons/year unmitigated)	9.62	4.40	9.48	0.01	7.19	0.24	7.43	1.51	0.22	1.73	1,031.25
2009 TOTALS (tons/year mitigated)	9.62	4.40	9.48	0.01	0.53	0.24	0.77	0.12	0.22	0.34	1,031.25
Percent Reduction	0.00	0.00	0.00	0.00	92.57	0.00	89.58	92.25	0.00	80.52	0.00
2010 TOTALS (tons/year unmitigated)	5.49	0.94	2.83	0.00	0.01	0.05	0.06	0.00	0.05	0.05	311.83
2010 TOTALS (tons/year mitigated)	5.49	0.94	2.83	0.00	0.01	0.05	0.06	0.00	0.05	0.05	311.83
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	10.77	1.93	15.37	0.04	2.06	1.99	2,422.03
TOTALS (tons/year, mitigated)	10.77	1.93	15.37	0.04	2.06	1.99	2,422.03
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	20.35	25.32	230.70	0.18	31.97	6.13	17,376.43
TOTALS (tons/year, mitigated)	19.32	23.93	218.08	0.16	30.23	5.80	16,425.48
Percent Reduction	5.06	5.49	5.47	11.11	5.44	5.38	5.47

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	31.12	27.25	246.07	0.22	34.03	8.12	19,798.46
TOTALS (tons/year, mitigated)	30.09	25.86	233.45	0.20	32.29	7.79	18,847.51
Percent Reduction	3.31	5.10	5.13	9.09	5.11	4.06	4.80

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2009	9.62	4.40	9.48	0.01	7.19	0.24	7.43	1.51	0.22	1.73	1,031.25
Fine Grading 06/01/2009-07/10/2009	0.15	1.24	0.66	0.00	7.16	0.06	7.22	1.49	0.06	1.55	111.69
Fine Grading Dust	0.00	0.00	0.00	0.00	7.16	0.00	7.16	1.49	0.00	1.49	0.00
Fine Grading Off Road Diesel	0.15	1.24	0.62	0.00	0.00	0.06	0.06	0.00	0.06	0.06	108.25
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.44
Asphalt 07/01/2009-07/15/2009	0.05	0.21	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.94
Paving Off-Gas	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.10	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	7.00
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.24
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
Building 07/15/2009-03/01/2010	0.57	2.94	8.60	0.01	0.03	0.16	0.20	0.01	0.15	0.16	887.11
Building Off Road Diesel	0.27	1.51	0.89	0.00	0.00	0.11	0.11	0.00	0.10	0.10	137.82
Building Vendor Trips	0.07	1.03	0.75	0.00	0.01	0.04	0.05	0.00	0.04	0.04	180.95
Building Worker Trips	0.23	0.39	6.95	0.01	0.03	0.01	0.04	0.01	0.01	0.02	568.35
Coating 07/31/2009-04/02/2010	8.85	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.51
Architectural Coating	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.51

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2010	5.49	0.94	2.83	0.00	0.01	0.05	0.06	0.00	0.05	0.05	311.83
Building 07/15/2009-03/01/2010	0.18	0.94	2.76	0.00	0.01	0.05	0.06	0.00	0.05	0.05	305.52
Building Off Road Diesel	0.09	0.49	0.30	0.00	0.00	0.04	0.04	0.00	0.03	0.03	47.44
Building Vendor Trips	0.02	0.32	0.24	0.00	0.00	0.01	0.01	0.00	0.01	0.01	62.29
Building Worker Trips	0.07	0.12	2.22	0.00	0.01	0.01	0.01	0.00	0.00	0.01	195.78
Coating 07/31/2009-04/02/2010	5.31	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.31
Architectural Coating	5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.31

Phase Assumptions

Phase: Fine Grading 6/1/2009 - 7/10/2009 - Default Fine Site Grading Description

Total Acres Disturbed: 95.43

Maximum Daily Acreage Disturbed: 23.86

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 7/1/2009 - 7/15/2009 - Default Paving Description

Acres to be Paved: 23.86

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

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2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 7/15/2009 - 3/1/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

3 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 7/31/2009 - 4/2/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2009	9.62	4.40	9.48	0.01	0.53	0.24	0.77	0.12	0.22	0.34	1,031.25
Fine Grading 06/01/2009-07/10/2009	0.15	1.24	0.66	0.00	0.50	0.06	0.56	0.10	0.06	0.16	111.69
Fine Grading Dust	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.10	0.00	0.10	0.00
Fine Grading Off Road Diesel	0.15	1.24	0.62	0.00	0.00	0.06	0.06	0.00	0.06	0.06	108.25
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.44
Asphalt 07/01/2009-07/15/2009	0.05	0.21	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.94
Paving Off-Gas	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.10	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	7.00
Paving On Road Diesel	0.01	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.24
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
Building 07/15/2009-03/01/2010	0.57	2.94	8.60	0.01	0.03	0.16	0.20	0.01	0.15	0.16	887.11
Building Off Road Diesel	0.27	1.51	0.89	0.00	0.00	0.11	0.11	0.00	0.10	0.10	137.82
Building Vendor Trips	0.07	1.03	0.75	0.00	0.01	0.04	0.05	0.00	0.04	0.04	180.95
Building Worker Trips	0.23	0.39	6.95	0.01	0.03	0.01	0.04	0.01	0.01	0.02	568.35
Coating 07/31/2009-04/02/2010	8.85	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.51
Architectural Coating	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.51

2010	5.49	0.94	2.83	0.00	0.01	0.05	0.06	0.00	0.05	0.05	311.83
Building 07/15/2009-03/01/2010	0.18	0.94	2.76	0.00	0.01	0.05	0.06	0.00	0.05	0.05	305.52
Building Off Road Diesel	0.09	0.49	0.30	0.00	0.00	0.04	0.04	0.00	0.03	0.03	47.44
Building Vendor Trips	0.02	0.32	0.24	0.00	0.00	0.01	0.01	0.00	0.01	0.01	62.29
Building Worker Trips	0.07	0.12	2.22	0.00	0.01	0.01	0.01	0.00	0.00	0.01	195.78
Coating 07/31/2009-04/02/2010	5.31	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.31
Architectural Coating	5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.31

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2009 - 7/10/2009 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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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	0.13	1.68	1.01	0.00	0.00	0.00	2,094.14
Hearth	3.57	0.23	13.07	0.04	2.06	1.99	325.67
Landscape	0.16	0.02	1.29	0.00	0.00	0.00	2.22
Consumer Products	5.50						
Architectural Coatings	1.41						
TOTALS (tons/year, unmitigated)	10.77	1.93	15.37	0.04	2.06	1.99	2,422.03

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.13	1.68	1.01	0.00	0.00	0.00	2,094.14
Hearth	3.57	0.23	13.07	0.04	2.06	1.99	325.67
Landscape	0.16	0.02	1.29	0.00	0.00	0.00	2.22
Consumer Products	5.50						
Architectural Coatings	1.41						
TOTALS (tons/year, mitigated)	10.77	1.93	15.37	0.04	2.06	1.99	2,422.03

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	2.13	2.61	24.38	0.02	3.33	0.64	1,820.86
Apartments mid rise	4.66	5.46	50.98	0.04	6.97	1.34	3,808.49
Junior college (2 yrs)	7.08	9.63	86.05	0.07	12.37	2.37	6,674.36
City park	0.02	0.01	0.10	0.00	0.01	0.00	7.86
Regnl shop. center	4.85	5.65	51.16	0.04	6.83	1.31	3,721.03
General office building	1.61	1.96	18.03	0.01	2.46	0.47	1,343.83
TOTALS (tons/year, unmitigated)	20.35	25.32	230.70	0.18	31.97	6.13	17,376.43

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	2.02	2.46	22.96	0.02	3.14	0.60	1,714.81
Apartments mid rise	4.43	5.14	48.01	0.04	6.56	1.26	3,586.68
Junior college (2 yrs)	6.72	9.12	81.49	0.06	11.72	2.25	6,320.34
City park	0.02	0.01	0.10	0.00	0.01	0.00	7.44
Regnl shop. center	4.60	5.35	48.45	0.03	6.47	1.24	3,523.66
General office building	1.53	1.85	17.07	0.01	2.33	0.45	1,272.55
TOTALS (tons/year, mitigated)	19.32	23.93	218.08	0.16	30.23	5.80	16,425.48

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Mix of Uses Mitigation

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Operational Mitigation Options Selected

Residential Mitigation Measures

NOTE this mitigation measure INCREASES Trips by 2.98%

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 1622.

The employment for the study area (within a 1/2 mile radius of the project) is 2.

Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Residential Transit Service Mitigation

Percent Reduction in Trips is 0.03% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

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Operational Mitigation Options Selected

Residential Mitigation Measures

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 2

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips is 0

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 6.26% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Number of Intersections per Square Mile is 241

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 100%

Residential Affordable Housing Mitigation

Percent Reduction in Trips is 0.52% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

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Operational Mitigation Options Selected

Residential Mitigation Measures

Inputs Selected:

The Percent of Housing Units that are Deed-Restricted Below Market Rate Housing is 13%

Nonresidential Mitigation Measures

Non-Residential Mix of Uses Mitigation

NOTE this mitigation measure INCREASES Trips by 2.98%

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 1622.

The employment for the study area (within a 1/2 mile radius of the project) is 2.

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Percent Reduction in Trips is 0.03%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 2

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Nonresidential Mitigation Measures

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips is 0

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 6.26%

Inputs Selected:

The Number of Intersections per Square Mile is 241

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 100%

Operational Settings:

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: 2010 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	49.33	9.57	dwelling units	148.00	1,416.36	10,601.83
Apartments mid rise	15.60	6.33	dwelling units	468.00	2,962.44	22,174.64

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Junior college (2 yrs)		24.00	1000 sq ft	228.70	5,488.80	39,397.75
City park		1.59	acres	5.10	8.11	46.14
Regnl shop. center		42.94	1000 sq ft	107.30	4,607.46	21,749.20
General office building		13.74	1000 sq ft	88.00	1,209.12	7,842.41
					15,692.29	101,811.97

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	1.4	98.2	0.4
Light Truck < 3750 lbs	13.3	2.3	93.9	3.8
Light Truck 3751-5750 lbs	20.3	0.5	99.5	0.0
Med Truck 5751-8500 lbs	7.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.1	0.0	72.7	27.3
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.7	0.0	14.3	85.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.7	67.6	32.4	0.0
School Bus	0.4	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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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)						
Junior college (2 yrs)				5.0	2.5	92.5
City park				5.0	2.5	92.5
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: I:\Projects\Active\Brentwood\Sciortino Ranch\Technical Reports\Air Data\URBEMIS\Sciortino Ranch.urb924

Project Name: Sciortino Ranch

Project Location: Contra Costa County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	170.17	121.37	158.37	0.14	477.31	6.53	483.83	99.69	6.00	105.70	18,531.40
2009 TOTALS (lbs/day mitigated)	170.17	121.37	158.37	0.14	33.36	6.53	39.88	6.98	6.00	12.98	18,531.40
2010 TOTALS (lbs/day unmitigated)	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61
2010 TOTALS (lbs/day mitigated)	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	40.37	9.40	19.84	0.00	0.07	0.07	11,499.38
TOTALS (lbs/day, mitigated)	40.37	9.40	19.84	0.00	0.07	0.07	11,499.38
Percent Reduction	0.00	0.00	0.00	NaN	0.00	0.00	0.00

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	106.07	119.36	1,219.84	0.99	175.25	33.66	99,631.46
TOTALS (lbs/day, mitigated)	100.87	112.85	1,153.05	0.93	165.68	31.81	94,179.09
Percent Reduction	4.90	5.45	5.48	6.06	5.46	5.50	5.47

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	146.44	128.76	1,239.68	0.99	175.32	33.73	111,130.84
TOTALS (lbs/day, mitigated)	141.24	122.25	1,172.89	0.93	165.75	31.88	105,678.47
Percent Reduction	3.55	5.06	5.39	6.06	5.46	5.48	4.91

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/1/2009-6/30/2009 Active Days: 22	9.95	83.00	43.81	0.00	477.21	4.22	481.43	99.66	3.88	103.54	7,445.71
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	477.21	4.22	481.43	99.66	3.88	103.54	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	477.20	0.00	477.20	99.66	0.00	99.66	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17

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Time Slice 7/1/2009-7/10/2009 Active Days: 8	19.93	**121.37**	61.27	0.03	**477.31**	**6.53**	**483.83**	**99.69**	**6.00**	**105.70**	11,434.28
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	477.21	4.22	481.43	99.66	3.88	103.54	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	477.20	0.00	477.20	99.66	0.00	99.66	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17
Time Slice 7/13/2009-7/14/2009 Active Days: 2	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32

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Time Slice 7/15/2009-7/15/2009 Active Days: 1	19.33	86.50	**158.37**	**0.14**	0.66	5.00	5.66	0.23	4.57	4.81	**18,531.40**
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Time Slice 7/16/2009-7/30/2009 Active Days: 11	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Time Slice 7/31/2009-12/31/2009 Active Days: 110	**170.17**	48.26	143.25	0.12	0.58	2.70	3.27	0.21	2.45	2.66	14,733.92
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Coating 07/31/2009-04/02/2010	160.82	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.08	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08

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Time Slice 1/1/2010-3/1/2010 Active Days: 42	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61
Building 07/15/2009-03/01/2010	8.64	44.58	131.39	0.12	0.57	2.49	3.05	0.20	2.26	2.46	14,548.42
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54	2,259.28
Building Vendor Trips	1.11	15.37	11.59	0.03	0.11	0.57	0.68	0.04	0.52	0.56	2,966.21
Building Worker Trips	3.44	5.90	105.49	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,322.93
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Time Slice 3/2/2010-4/2/2010 Active Days: 24	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19

Phase Assumptions

Phase: Fine Grading 6/1/2009 - 7/10/2009 - Default Fine Site Grading Description

Total Acres Disturbed: 95.43

Maximum Daily Acreage Disturbed: 23.86

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 7/1/2009 - 7/15/2009 - Default Paving Description

Acres to be Paved: 23.86

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 7/15/2009 - 3/1/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

3 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 7/31/2009 - 4/2/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 6/1/2009-6/30/2009 Active Days: 22	9.95	83.00	43.81	0.00	33.26	4.22	37.48	6.95	3.88	10.83	7,445.71
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	33.26	4.22	37.48	6.95	3.88	10.83	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	33.25	0.00	33.25	6.94	0.00	6.94	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17
Time Slice 7/1/2009-7/10/2009 Active Days: 8	19.93	**121.37**	61.27	0.03	33.36	**6.53**	39.88	6.98	**6.00**	12.98	11,434.28
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	33.26	4.22	37.48	6.95	3.88	10.83	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	33.25	0.00	33.25	6.94	0.00	6.94	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17

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Time Slice 7/13/2009-7/14/2009 Active Days: 2	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Time Slice 7/15/2009-7/15/2009 Active Days: 1	19.33	86.50	**158.37**	**0.14**	0.66	5.00	5.66	0.23	4.57	4.81	**18,531.40**
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Time Slice 7/16/2009-7/30/2009 Active Days: 11	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17

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Time Slice 7/31/2009-12/31/2009 Active Days: 110	**170.17**	48.26	143.25	0.12	0.58	2.70	3.27	0.21	2.45	2.66	14,733.92
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Coating 07/31/2009-04/02/2010	160.82	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.08	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08
Time Slice 1/1/2010-3/1/2010 Active Days: 42	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61
Building 07/15/2009-03/01/2010	8.64	44.58	131.39	0.12	0.57	2.49	3.05	0.20	2.26	2.46	14,548.42
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54	2,259.28
Building Vendor Trips	1.11	15.37	11.59	0.03	0.11	0.57	0.68	0.04	0.52	0.56	2,966.21
Building Worker Trips	3.44	5.90	105.49	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,322.93
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Time Slice 3/2/2010-4/2/2010 Active Days: 24	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2009 - 7/10/2009 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

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PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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	0.69	9.22	5.51	0.00	0.02	0.02	11,474.73
Hearth - No Summer Emissions							
Landscape	1.81	0.18	14.33	0.00	0.05	0.05	24.65
Consumer Products	30.14						
Architectural Coatings	7.73						
TOTALS (lbs/day, unmitigated)	40.37	9.40	19.84	0.00	0.07	0.07	11,499.38

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Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.69	9.22	5.51	0.00	0.02	0.02	11,474.73
Hearth - No Summer Emissions							
Landscape	1.81	0.18	14.33	0.00	0.05	0.05	24.65
Consumer Products	30.14						
Architectural Coatings	7.73						
TOTALS (lbs/day, mitigated)	40.37	9.40	19.84	0.00	0.07	0.07	11,499.38

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction

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	11.34	12.29	129.93	0.10	18.25	3.51	10,437.40
Apartments mid rise	25.38	25.70	271.76	0.22	38.18	7.34	21,830.73
Junior college (2 yrs)	36.35	45.41	455.76	0.38	67.79	13.00	38,281.49
City park	0.10	0.05	0.55	0.00	0.08	0.02	45.07
Regnl shop. center	24.47	26.69	266.17	0.21	37.45	7.20	21,332.99
General office building	8.43	9.22	95.67	0.08	13.50	2.59	7,703.78
TOTALS (lbs/day, unmitigated)	106.07	119.36	1,219.84	0.99	175.25	33.66	99,631.46

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Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	10.77	11.57	122.36	0.10	17.19	3.30	9,829.51
Apartments mid rise	24.19	24.21	255.94	0.20	35.96	6.91	20,559.28
Junior college (2 yrs)	34.55	43.00	431.58	0.36	64.20	12.31	36,250.99
City park	0.10	0.05	0.52	0.00	0.08	0.01	42.68
Regnl shop. center	23.23	25.28	252.05	0.20	35.46	6.82	20,201.46
General office building	8.03	8.74	90.60	0.07	12.79	2.46	7,295.17
TOTALS (lbs/day, mitigated)	100.87	112.85	1,153.05	0.93	165.68	31.81	94,179.09

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Mix of Uses Mitigation

NOTE this mitigation measure INCREASES Trips by 2.98%

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 1622.

The employment for the study area (within a 1/2 mile radius of the project) is 2.

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 2% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Residential Transit Service Mitigation

Percent Reduction in Trips is 0.03% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 2

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips is 0

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 6.26% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

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Operational Mitigation Options Selected

Residential Mitigation Measures

Inputs Selected:

The Number of Intersections per Square Mile is 241

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 100%

Residential Affordable Housing Mitigation

Percent Reduction in Trips is 0.52% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Percent of Housing Units that are Deed-Restricted Below Market Rate Housing is 13%

Nonresidential Mitigation Measures

Non-Residential Mix of Uses Mitigation

NOTE this mitigation measure INCREASES Trips by 2.98%

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 1622.

The employment for the study area (within a 1/2 mile radius of the project) is 2.

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Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Percent Reduction in Trips is 0.03%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 2

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips is 0

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 6.26%

Inputs Selected:

The Number of Intersections per Square Mile is 241

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

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Nonresidential Mitigation Measures

Direct Parallel Routes Exist is 100%

Operational Settings:

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: 2010 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	49.33	9.57	dwelling units	148.00	1,416.36	10,601.83
Apartments mid rise	15.60	6.33	dwelling units	468.00	2,962.44	22,174.64
Junior college (2 yrs)		24.00	1000 sq ft	228.70	5,488.80	39,397.75
City park		1.59	acres	5.10	8.11	46.14
Regnl shop. center		42.94	1000 sq ft	107.30	4,607.46	21,749.20
General office building		13.74	1000 sq ft	88.00	1,209.12	7,842.41
					15,692.29	101,811.97

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	1.4	98.2	0.4
Light Truck < 3750 lbs	13.3	2.3	93.9	3.8
Light Truck 3751-5750 lbs	20.3	0.5	99.5	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med Truck 5751-8500 lbs	7.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.1	0.0	72.7	27.3
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.7	0.0	14.3	85.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.7	67.6	32.4	0.0
School Bus	0.4	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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)						
Junior college (2 yrs)				5.0	2.5	92.5
City park				5.0	2.5	92.5

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5

Operational Changes to Defaults

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: I:\Projects\Active\Brentwood\Sciortino Ranch\Technical Reports\Air Data\URBEMIS\Sciortino Ranch.urb924

Project Name: Sciortino Ranch

Project Location: Contra Costa County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	170.17	121.37	158.37	0.14	477.31	6.53	483.83	99.69	6.00	105.70	18,531.40
2009 TOTALS (lbs/day mitigated)	170.17	121.37	158.37	0.14	33.36	6.53	39.88	6.98	6.00	12.98	18,531.40
2010 TOTALS (lbs/day unmitigated)	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61
2010 TOTALS (lbs/day mitigated)	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	125.80	16.95	325.25	0.94	50.50	48.61	22,063.95
TOTALS (lbs/day, mitigated)	125.80	16.95	325.25	0.94	50.50	48.61	22,063.95
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	122.34	177.49	1,352.70	0.86	175.25	33.66	86,377.12
TOTALS (lbs/day, mitigated)	115.66	167.79	1,278.70	0.81	165.68	31.81	81,649.96
Percent Reduction	5.46	5.47	5.47	5.81	5.46	5.50	5.47

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	248.14	194.44	1,677.95	1.80	225.75	82.27	108,441.07
TOTALS (lbs/day, mitigated)	241.46	184.74	1,603.95	1.75	216.18	80.42	103,713.91
Percent Reduction	2.69	4.99	4.41	2.78	4.24	2.25	4.36

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/1/2009-6/30/2009 Active Days: 22	9.95	83.00	43.81	0.00	477.21	4.22	481.43	99.66	3.88	103.54	7,445.71
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	477.21	4.22	481.43	99.66	3.88	103.54	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	477.20	0.00	477.20	99.66	0.00	99.66	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17

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Time Slice 7/1/2009-7/10/2009 Active Days: 8	19.93	**121.37**	61.27	0.03	**477.31**	**6.53**	**483.83**	**99.69**	**6.00**	**105.70**	11,434.28
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	477.21	4.22	481.43	99.66	3.88	103.54	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	477.20	0.00	477.20	99.66	0.00	99.66	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17
Time Slice 7/13/2009-7/14/2009 Active Days: 2	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32

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Time Slice 7/15/2009-7/15/2009 Active Days: 1	19.33	86.50	**158.37**	**0.14**	0.66	5.00	5.66	0.23	4.57	4.81	**18,531.40**
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Time Slice 7/16/2009-7/30/2009 Active Days: 11	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Time Slice 7/31/2009-12/31/2009 Active Days: 110	**170.17**	48.26	143.25	0.12	0.58	2.70	3.27	0.21	2.45	2.66	14,733.92
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Coating 07/31/2009-04/02/2010	160.82	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.08	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08

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Time Slice 1/1/2010-3/1/2010 Active Days: 42	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61
Building 07/15/2009-03/01/2010	8.64	44.58	131.39	0.12	0.57	2.49	3.05	0.20	2.26	2.46	14,548.42
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54	2,259.28
Building Vendor Trips	1.11	15.37	11.59	0.03	0.11	0.57	0.68	0.04	0.52	0.56	2,966.21
Building Worker Trips	3.44	5.90	105.49	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,322.93
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Time Slice 3/2/2010-4/2/2010 Active Days: 24	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19

Phase Assumptions

Phase: Fine Grading 6/1/2009 - 7/10/2009 - Default Fine Site Grading Description

Total Acres Disturbed: 95.43

Maximum Daily Acreage Disturbed: 23.86

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 7/1/2009 - 7/15/2009 - Default Paving Description

Acres to be Paved: 23.86

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 7/15/2009 - 3/1/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

3 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 7/31/2009 - 4/2/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 6/1/2009-6/30/2009 Active Days: 22	9.95	83.00	43.81	0.00	33.26	4.22	37.48	6.95	3.88	10.83	7,445.71
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	33.26	4.22	37.48	6.95	3.88	10.83	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	33.25	0.00	33.25	6.94	0.00	6.94	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17
Time Slice 7/1/2009-7/10/2009 Active Days: 8	19.93	**121.37**	61.27	0.03	33.36	**6.53**	39.88	6.98	**6.00**	12.98	11,434.28
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Fine Grading 06/01/2009-07/10/2009	9.95	83.00	43.81	0.00	33.26	4.22	37.48	6.95	3.88	10.83	7,445.71
Fine Grading Dust	0.00	0.00	0.00	0.00	33.25	0.00	33.25	6.94	0.00	6.94	0.00
Fine Grading Off Road Diesel	9.86	82.84	41.01	0.00	0.00	4.21	4.21	0.00	3.88	3.88	7,216.54
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.09	0.16	2.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	229.17

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Time Slice 7/13/2009-7/14/2009 Active Days: 2	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Time Slice 7/15/2009-7/15/2009 Active Days: 1	19.33	86.50	**158.37**	**0.14**	0.66	5.00	5.66	0.23	4.57	4.81	**18,531.40**
Asphalt 07/01/2009-07/15/2009	9.98	38.38	17.46	0.03	0.10	2.31	2.40	0.03	2.12	2.15	3,988.56
Paving Off-Gas	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.02	17.99	9.48	0.00	0.00	1.55	1.55	0.00	1.43	1.43	1,272.41
Paving On Road Diesel	1.22	20.30	6.42	0.02	0.09	0.75	0.84	0.03	0.69	0.72	2,588.83
Paving Worker Trips	0.05	0.09	1.56	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.32
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Time Slice 7/16/2009-7/30/2009 Active Days: 11	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17

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Time Slice 7/31/2009-12/31/2009 Active Days: 110	**170.17**	48.26	143.25	0.12	0.58	2.70	3.27	0.21	2.45	2.66	14,733.92
Building 07/15/2009-03/01/2010	9.35	48.13	140.92	0.12	0.57	2.69	3.26	0.20	2.45	2.65	14,542.84
Building Off Road Diesel	4.37	24.71	14.63	0.00	0.00	1.81	1.81	0.00	1.67	1.67	2,259.28
Building Vendor Trips	1.20	16.94	12.30	0.03	0.11	0.63	0.74	0.04	0.58	0.62	2,966.39
Building Worker Trips	3.79	6.47	113.98	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,317.17
Coating 07/31/2009-04/02/2010	160.82	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.08	0.13	2.34	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.08
Time Slice 1/1/2010-3/1/2010 Active Days: 42	169.45	44.70	133.55	0.12	0.58	2.49	3.07	0.21	2.27	2.47	14,739.61
Building 07/15/2009-03/01/2010	8.64	44.58	131.39	0.12	0.57	2.49	3.05	0.20	2.26	2.46	14,548.42
Building Off Road Diesel	4.08	23.31	14.31	0.00	0.00	1.67	1.67	0.00	1.54	1.54	2,259.28
Building Vendor Trips	1.11	15.37	11.59	0.03	0.11	0.57	0.68	0.04	0.52	0.56	2,966.21
Building Worker Trips	3.44	5.90	105.49	0.09	0.46	0.25	0.70	0.16	0.20	0.37	9,322.93
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Time Slice 3/2/2010-4/2/2010 Active Days: 24	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Coating 07/31/2009-04/02/2010	160.81	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19
Architectural Coating	160.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.07	0.12	2.16	0.00	0.01	0.01	0.01	0.00	0.00	0.01	191.19

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2009 - 7/10/2009 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

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PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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	0.69	9.22	5.51	0.00	0.02	0.02	11,474.73
Hearth	87.24	7.73	319.74	0.94	50.48	48.59	10,589.22
Landscaping - No Winter Emissions							
Consumer Products	30.14						
Architectural Coatings	7.73						
TOTALS (lbs/day, unmitigated)	125.80	16.95	325.25	0.94	50.50	48.61	22,063.95

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Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.69	9.22	5.51	0.00	0.02	0.02	11,474.73
Hearth	87.24	7.73	319.74	0.94	50.48	48.59	10,589.22
Landscaping - No Winter Emissions							
Consumer Products	30.14						
Architectural Coatings	7.73						
TOTALS (lbs/day, mitigated)	125.80	16.95	325.25	0.94	50.50	48.61	22,063.95

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction

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	12.37	18.32	140.82	0.09	18.25	3.51	9,057.21
Apartments mid rise	25.88	38.32	294.54	0.19	38.18	7.34	18,943.93
Junior college (2 yrs)	43.74	67.56	503.01	0.33	67.79	13.00	33,152.51
City park	0.06	0.08	0.62	0.00	0.08	0.02	39.07
Regnl shop. center	30.77	39.48	308.68	0.18	37.45	7.20	18,501.58
General office building	9.52	13.73	105.03	0.07	13.50	2.59	6,682.82
TOTALS (lbs/day, unmitigated)	122.34	177.49	1,352.70	0.86	175.25	33.66	86,377.12

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Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	11.65	17.25	132.62	0.09	17.19	3.30	8,529.70
Apartments mid rise	24.37	36.09	277.39	0.18	35.96	6.91	17,840.62
Junior college (2 yrs)	41.42	63.98	476.33	0.31	64.20	12.31	31,394.06
City park	0.06	0.08	0.59	0.00	0.08	0.01	36.99
Regnl shop. center	29.14	37.39	292.31	0.17	35.46	6.82	17,520.23
General office building	9.02	13.00	99.46	0.06	12.79	2.46	6,328.36
TOTALS (lbs/day, mitigated)	115.66	167.79	1,278.70	0.81	165.68	31.81	81,649.96

Operational Mitigation Options Selected

Residential Mitigation Measures

Residential Mix of Uses Mitigation

NOTE this mitigation measure INCREASES Trips by 2.98%

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 1622.

The employment for the study area (within a 1/2 mile radius of the project) is 2.

Residential Local-Serving Retail Mitigation

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Operational Mitigation Options Selected

Residential Mitigation Measures

Percent Reduction in Trips is 2% (calculated as a % of 9.57 trips/day)))

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Residential Transit Service Mitigation

Percent Reduction in Trips is 0.03% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 2

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips is 0

Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 6.26% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

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Operational Mitigation Options Selected

Residential Mitigation Measures

Inputs Selected:

The Number of Intersections per Square Mile is 241

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

Direct Parallel Routes Exist is 100%

Residential Affordable Housing Mitigation

Percent Reduction in Trips is 0.52% (calculated as a % of 9.57 trips/day)

Note that the above percent is applied to the 'double counting adjusted' trip rate

to get Mitigated Trips

Inputs Selected:

The Percent of Housing Units that are Deed-Restricted Below Market Rate Housing is 13%

Nonresidential Mitigation Measures

Non-Residential Mix of Uses Mitigation

NOTE this mitigation measure INCREASES Trips by 2.98%

Inputs Selected:

The number of housing units within a 1/2 mile radius of the project, plus the

number of residential units included in the project are 1622.

The employment for the study area (within a 1/2 mile radius of the project) is 2.

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Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 2%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was selected.

Non-Residential Transit Service Mitigation

Percent Reduction in Trips is 0.03%

Inputs Selected:

The Number of Daily Weekday Buses Stopping Within 1/4 Mile of Site is 2

The Number of Daily Rail or Bus Rapid Transit Stops Within 1/2 Mile of Site is 0

The Number of Dedicated Daily Shuttle Trips is 0

Non-Residential Pedestrian/Bicycle Friendliness Mitigation

Percent Reduction in Trips is 6.26%

Inputs Selected:

The Number of Intersections per Square Mile is 241

The Percent of Streets with Sidewalks on One Side is 0%

The Percent of Streets with Sidewalks on Both Sides is 90%

The Percent of Arterials/Collectors with Bike Lanes or where Suitable,

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Nonresidential Mitigation Measures

Direct Parallel Routes Exist is 100%

Operational Settings:

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: 2010 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	49.33	9.57	dwelling units	148.00	1,416.36	10,601.83
Apartments mid rise	15.60	6.33	dwelling units	468.00	2,962.44	22,174.64
Junior college (2 yrs)		24.00	1000 sq ft	228.70	5,488.80	39,397.75
City park		1.59	acres	5.10	8.11	46.14
Regnl shop. center		42.94	1000 sq ft	107.30	4,607.46	21,749.20
General office building		13.74	1000 sq ft	88.00	1,209.12	7,842.41
					15,692.29	101,811.97

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	1.4	98.2	0.4
Light Truck < 3750 lbs	13.3	2.3	93.9	3.8
Light Truck 3751-5750 lbs	20.3	0.5	99.5	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med Truck 5751-8500 lbs	7.7	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.1	0.0	72.7	27.3
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	0.7	0.0	14.3	85.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.7	67.6	32.4	0.0
School Bus	0.4	0.0	0.0	100.0
Motor Home	0.8	0.0	87.5	12.5

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)						
Junior college (2 yrs)				5.0	2.5	92.5
City park				5.0	2.5	92.5

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regnl shop. center				2.0	1.0	97.0
General office building				35.0	17.5	47.5

Operational Changes to Defaults

APPENDIX F

Environmental Noise Assessment

Sciortino Ranch

City of Brentwood, California

Job # 2008-219

Prepared For:

Raney Planning & Management, Inc.

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Sacramento, California 95834

Attn: Nick Pappani

Prepared By:

j.c. brennan & associates, Inc.

Jim Brennan
President
Member, Institute of Noise Control Engineering

December 2, 2008

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NOISE

INTRODUCTION

This report has been prepared to address the noise impacts due to and upon the proposed Sciortino Ranch project, which is located within the City of Brentwood, California. The proposed Sciortino Ranch project site is located east of the intersection of Sand Creek Road and Brentwood Boulevard (State Route 4) and is approximately 65 acres is size. Sand Creek Road is planned to extend through the project site in the future. The project area is bounded by Brentwood Boulevard to the west and residential uses to the north and south. Approved residential uses are in the beginning stages of construction to the east of the project site. The project site consists of three parcels, which are identified by Assessor's Parcel Numbers (APN) 016-170-011, -012, and -013. Figure 1 shows the project location.

The proposed Sciortino Ranch project would allow for the construction of approximately 900 residential units and up to approximately 277,000 sq. ft of retail, office, and institutional space. Figure 2 shows the project site plan.

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.

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.

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

Figure 1
Sciortino Ranch – City of Brentwood, California
Project Site and Noise Measurement Locations

△ : Continuous Noise Measurement Site

□ : Short-Term Noise Measurement Site

— : Project Site

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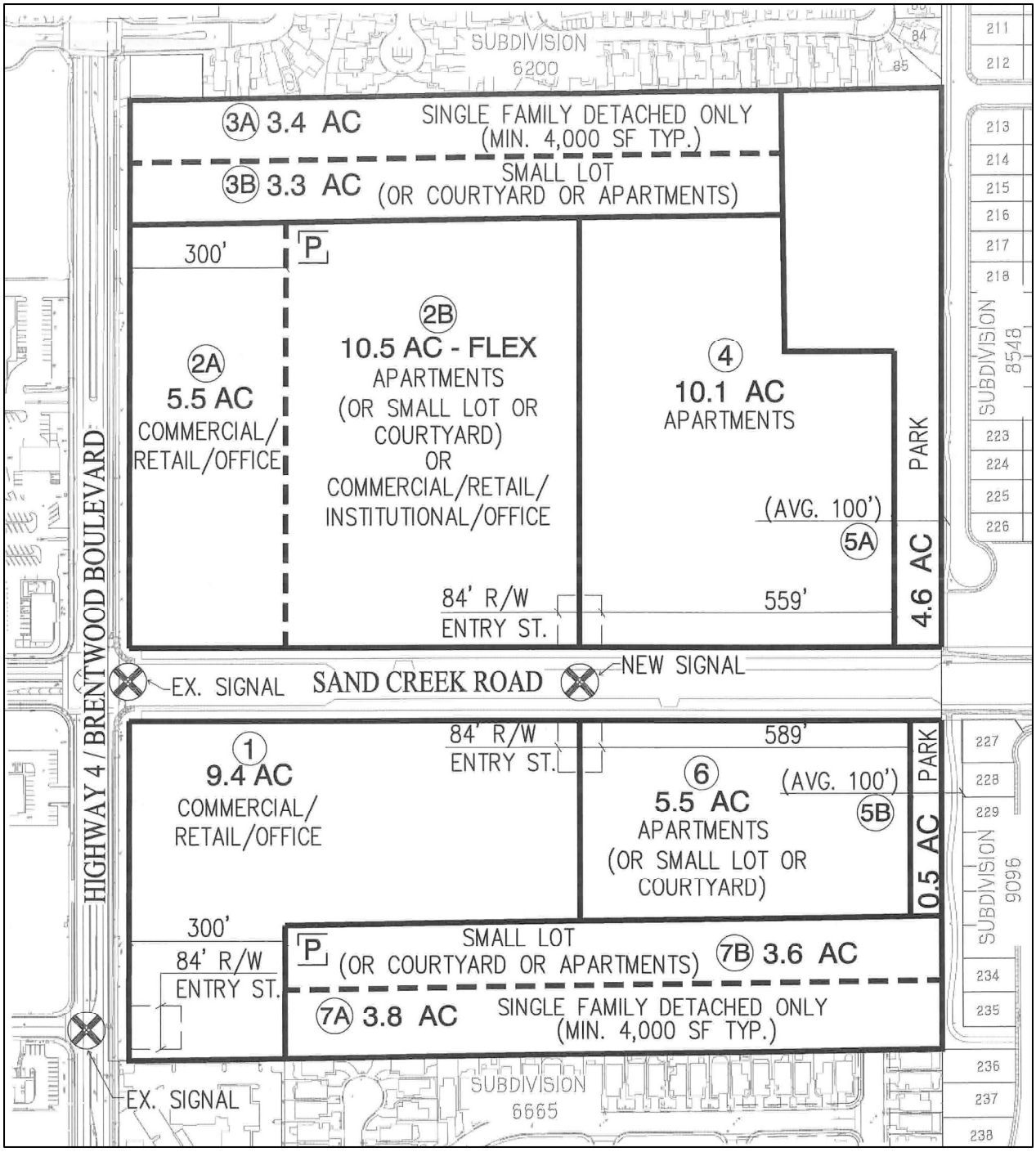
j.c. brennan & associates
consultants in acoustics

Figure 2
Sciortino Ranch – City of Brentwood, California
Project Site Plan



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

Table 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.

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.

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 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 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 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

EXISTING NOISE ENVIRONMENT

Major Noise Sources in the Project Vicinity

Transportation:

Vehicle traffic on Brentwood Boulevard (S.R. 4) is a primary noise source within the project site. Since S.R. 4 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. For the Brentwood Boulevard Specific Plan, the assumption was made that the future bypass would divert through traffic from Brentwood Boulevard.

Non-Transportation:

Existing commercial land uses, located along Brentwood Boulevard and west of the project site, inherently have noise producing components associated with their operations. These components generally include truck deliveries, on-site truck circulation, trash pickup, parking lot use, HVAC equipment and loading docks.

Land Uses in the Project Vicinity

Land uses in the immediate project vicinity consist of single-family residential to north and to the south of the site, an assisted care/convalescent home is located at the northwest corner of the intersection of Applewood Common and Brentwood Boulevard, commercial uses are located to the west of the site, and across Brentwood Boulevard, and new development of residential uses are under construction to the east.

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 emission 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 traffic volumes obtained from Kimley-Horn and Associates, Inc., and j.c. brennan & associates, Inc., site observations. A compete listing of the FHWA model inputs is provided in Appendix B.

Table 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 3 Existing No Project Traffic Noise Levels						
Roadway	Segment	Distance[1]	Traffic Noise Level, Ldn	Distance to Ldn Contours		
				70 Ldn	65 Ldn	60 Ldn
Brentwood Blvd.	North of Lone Tree	100’	63.6 dB	37’	81’	174’
Brentwood Blvd.	Lone Tree to Sunrise	100’	64.5 dB	43’	93’	200’
Brentwood Blvd.	Sunriset to Gregory	100’	64.5 dB	43’	92’	198’
Brentwood Blvd.	Gregory to Homecoming	100’	64.4 dB	42’	92’	197’
Brentwood Blvd.	Homecoming to Grant / Sunset	100’	64.5 dB	43’	93’	199’
Brentwood Blvd.	Grant / Sunset to Sunset Court	100’	64.7 dB	44’	96’	206’
Brentwood Blvd.	Sunset Court to Havenwood	100’	64.8 dB	45’	97’	209’
Brentwood Blvd.	Havenwood to Applewood	100’	64.8 dB	45’	97’	209’
Brentwood Blvd.	Applewood to Sand Creek	100’	65.0 dB	46’	100’	215’
Brentwood Blvd.	Sand Creek to Technology	100’	64.8 dB	45’	98’	210’
Brentwood Blvd.	Technology to Village	100’	64.9 dB	46’	99’	214’
Brentwood Blvd.	Village to Central / Sycamore	100’	64.7 dB	44’	96’	206’
Brentwood Blvd.	South of Central / Sycamore	100’	63.7 dB	38’	82’	177’
Sand Creek Road	Brentwood to O'Hara	100’	62.3 dB	31’	66’	143’
Sand Creek Road	West of O'Hara	100’	64.1 dB	40’	87’	187’
O'Hara Ave.	Sand Creek to Saddle Creek	100’	62.9 dB	34’	73’	156’
Lone Tree	East of Brentwood	100’	52.3 dB	7’	14’	31’
Lone Tree	West of Brentwood	100’	61.6 dB	27’	59’	127’
Grant Street	West of Brentwood	100’	56.7 dB	13’	28’	60’
Sunset Road	East of Brentwood	100’	60.4 dB	23’	49’	106’
Havenwood Ave.	East of Brentwood	100’	51.7 dB	6’	13’	28’
Havenwood Ave.	West of Brentwood	100’	46.1 dB	3’	5’	12’
Sand Creek Road	East of Brentwood	100’	48.4 dB	4’	8’	17’
Central Blvd.	West of Brentwood	100’	59.1 dB	19’	40’	87’
Sycamore Ave.	East of Brentwood	100’	59.0 dB	20’	42’	91’
[1]Distances are reference distances from centerline of roadway.						

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 two locations within the project area, on October 28-30, 2008 and on August 1-2, 2007. In addition, short-term noise level measurements were conducted at three locations on the project site. The intent of the noise level measurements was to determine the existing ambient noise levels on the project site, and to determine the effective day/night distribution of traffic along Brentwood Boulevard. The results of the noise level measurements are shown in Table 4. Continuous noise monitoring results are presented graphically in Appendix C. The noise measurement sites are shown on Figure 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
Sciortino Ranch – City of Brentwood, California
Existing Ambient Noise Monitoring Results

Site	Date	Measured Ldn	Average Hourly Daytime (7:00am - 10:00pm)			Average Hourly Nighttime (10:00pm – 7:00am)		
			Leq	L50	Lmax	Leq	L50	Lmax
Continuous Noise Level Measurement Sites								
A	October 28-29, 2008	52.6 dB	50.3 dB	43.5 dB	61.7 dB	44.9 dB	43.3 dB	56.4 dB
	October 29-30, 2008	53.8 dB	53.0 dB	47.8 dB	62.8 dB	44.8 dB	42.3 dB	56.7 dB
B	August 1-2, 2007	69.2 dB	66.7 dB	63.4 dB	82.2 dB	61.6 dB	54.3 dB	77.1 dB
Short-Term Noise Level Measurement Sites								
1	October 30, 2008	N/A	51.8 dB	51.1 dB	62.1 dB	@ 10:04 a.m.		
		N/A	50.5 dB	49.7 dB	59.3 dB	@ 1:29 p.m.		
2	October 30, 2008	N/A	58.4 dB	56.3 dB	73.9 dB	@ 10:31 a.m.		
		N/A	58.1 dB	56.9 dB	63.4 dB	@1:52 p.m.		
3	October 30, 2008	N/A	53.9 dB	51.6 dB	67.3 dB	@ 11:00 a.m.		
		N/A	54.9 dB	54.0 dB	61.4 dB	@ 2:16 p.m.		
Source: j.c. brennan & associates, Inc. – 2007, 2008								

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

Site A:

This continuous noise measurement site was located at a single-family residential receiver at 400 Grove Wood Loop, and is adjacent to the north property line of the project site. The noise measurements were conducted for a period of 48-hours. This noise measurement site represents noise sensitive receivers adjacent to the north property line of the project site.

Site B:

This continuous noise measurement site was conducted for a period of 24-hours, during the Brentwood Boulevard Specific Plan study in 2007. The noise measurement site is located at the southeast corner of Sunset Court and Brentwood Boulevard, which is one block north of the project site. This was the property of the Perez Nursery. The noise measurements were conducted at a distance of 50 feet from the Brentwood Boulevard centerline.

Site 1:

This short-term noise measurement site was located on the southeast portion of the project site and adjacent to existing single-family residential uses. This noise measurement site represents proposed residential receivers within the southeast portion of the project site.

Site 2:

This short-term noise measurement site was located on the southwest portion of the project site and adjacent to existing single-family residential uses. This noise measurement site represents proposed residential receivers within the southwest portion of the project site.

Site 3:

This short-term noise measurement site was located on the northwest portion of the project site and adjacent to existing single-family residential uses. This noise measurement site represents proposed residential receivers within the northwest portion of the project site.

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 5
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 6
City of Brentwood Stationary Noise Source Criteria

Maximum
Non-Transportation 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.

Action 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.

[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).

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 7 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.

Table 7
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. However, vibration levels associated with construction activities 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 8, 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 8. 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 8 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 6 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 7 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 plus project, cumulative, and cumulative plus project scenarios. Existing plus approved projects is referred to as baseline for this report.

In order to assess the potential for noise impacts at future noise sensitive development along the Brentwood Boulevard, j.c. brennan & associates, Inc. calculated exterior noise levels at a representative distance of 100 feet from the roadway centerline.

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 100 feet from the roadway centerlines. Table 9 shows the predicted traffic noise level increases on the local roadway network for the baseline and baseline plus project conditions. Table 10 shows the predicted traffic noise level increases on the local roadway network for the Cumulative and Cumulative plus Project conditions. Appendix B provides the complete inputs and results to the FHWA model for each of the traffic scenarios.

Table 9
Predicted Baseline and Baseline Plus Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Baseline			Distance to Contours (feet) Baseline + Project		
Roadway	Segment	Distance[1]	Baseline	Baseline + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Brentwood Blvd.	North of Lone Tree	100’	64.2 dB	65.0 dB	0.8 dB	41’	89’	192’	46’	100’	216’
Brentwood Blvd.	Lone Tree to Sunrise	100’	65.5 dB	66.6 dB	1.1 dB	50’	108’	233’	59’	128’	276’
Brentwood Blvd.	Sunriset to Gregory	100’	65.5 dB	66.6 dB	1.1 dB	50’	108’	233’	60’	128’	277’
Brentwood Blvd.	Gregory to Homecoming	100’	65.5 dB	66.6 dB	1.1 dB	50’	108’	232’	59’	128’	276’
Brentwood Blvd.	Homecoming to Grant / Sunset	100’	65.5 dB	66.6 dB	1.1 dB	50’	109’	234’	60’	129’	277’
Brentwood Blvd.	Grant / Sunset to Sunset Court	100’	66.0 dB	67.0 dB	1.0 dB	54’	117’	252’	63’	136’	293’
Brentwood Blvd.	Sunset Court to Havenwood	100’	66.1 dB	67.1 dB	1.0 dB	55’	118’	254’	64’	137’	296’
Brentwood Blvd.	Havenwood to Applewood	100’	66.1 dB	67.1 dB	1.0 dB	55’	118’	255’	64’	138’	297’
Brentwood Blvd.	Applewood to Sand Creek	100’	66.2 dB	67.2 dB	1.0 dB	56’	121’	261’	65’	140’	302’
Brentwood Blvd.	Sand Creek to Technology	100’	65.7 dB	66.7 dB	1.0 dB	52’	112’	240’	60’	129’	278’
Brentwood Blvd.	Technology to Village	100’	65.8 dB	66.7 dB	0.9 dB	52’	112’	242’	60’	130’	280’
Brentwood Blvd.	Village to Central / Sycamore	100’	65.6 dB	66.5 dB	0.9 dB	51’	109’	235’	59’	127’	273’
Brentwood Blvd.	South of Central / Sycamore	100’	64.6 dB	65.6 dB	1.0 dB	44’	94’	203’	51’	110’	238’
Sand Creek Road	Brentwood to O'Hara	100’	63.3 dB	64.5 dB	1.2 dB	36’	77’	167’	43’	92’	199’
Sand Creek Road	West of O'Hara	100’	64.8 dB	65.6 dB	0.8 dB	45’	97’	209’	51’	110’	238’
O'Hara Ave.	Sand Creek to Saddle Creek	100’	62.9 dB	62.9 dB	0.0 dB	34’	73’	156’	34’	73’	156’
Lone Tree	East of Brentwood	100’	52.3 dB	52.3 dB	0.0 dB	7’	14’	31’	7’	14’	31’
Lone Tree	West of Brentwood	100’	62.5 dB	63.6 dB	1.1 dB	32’	68’	147’	38’	81’	175’
Grant Street	West of Brentwood	100’	59.8 dB	59.8 dB	0.0 dB	21’	45’	96’	21’	45’	96’
Sunset Road	East of Brentwood	100’	62.8 dB	62.8 dB	0.0 dB	33’	72’	155’	33’	72’	155’
Havenwood Ave.	East of Brentwood	100’	51.7 dB	51.7 dB	0.0 dB	6’	13’	28’	6’	13’	28’
Havenwood Ave.	West of Brentwood	100’	50.9 dB	50.9 dB	0.0 dB	5’	11’	25’	5’	11’	25’
Sand Creek Road	East of Brentwood	100’	48.4 dB	64.5 dB	**16.1 dB**	4’	8’	17’	43’	93’	200’
Central Blvd.	West of Brentwood	100’	59.8 dB	60.3 dB	0.5 dB	21’	45’	97’	23’	49’	105’
Sycamore Ave.	East of Brentwood	100’	59.0 dB	59.0 dB	0.0 dB	20’	42’	91’	20’	42’	91’

[1]Distances are reference distances from centerline of roadway.
Bold indicates traffic noise level increases greater than 4 dB.

Table 10
Predicted Cumulative and Cumulative Plus Project Traffic Noise Levels

			Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Cumulative			Distance to Contours (feet) Cumulative + Project		
Roadway	Segment	Distance[1]	Cumulative	Cumulative + Project	Change	70 Ldn	65 Ldn	60 Ldn	70 Ldn	65 Ldn	60 Ldn
Brentwood Blvd.	North of Lone Tree	100	66.3 dB	66.8 dB	0.5 dB	56’	121’	261’	61’	131’	282’
Brentwood Blvd.	Lone Tree to Sunrise	100	66.9 dB	67.7 dB	0.8 dB	62’	133’	287’	70’	151’	326’
Brentwood Blvd.	Sunriset to Gregory	100	67.0 dB	67.8 dB	0.8 dB	63’	135’	291’	71’	153’	330’
Brentwood Blvd.	Gregory to Homecoming	100	66.9 dB	67.7 dB	0.8 dB	62’	134’	288’	71’	152’	327’
Brentwood Blvd.	Homecoming to Grant / Sunset	100	67.1 dB	67.9 dB	0.8 dB	64’	137’	295’	72’	155’	334’
Brentwood Blvd.	Grant / Sunset to Sunset Court	100	67.4 dB	68.2 dB	0.8 dB	67’	145’	312’	75’	163’	350’
Brentwood Blvd.	Sunset Court to Havenwood	100	66.4 dB	67.4 dB	1.0 dB	58’	125’	269’	67’	144’	309’
Brentwood Blvd.	Havenwood to Applewood	100	66.5 dB	67.4 dB	0.9 dB	59’	127’	273’	68’	145’	313’
Brentwood Blvd.	Applewood to Sand Creek	100	66.6 dB	67.5 dB	0.9 dB	59’	128’	275’	68’	146’	315’
Brentwood Blvd.	Sand Creek to Technology	100	66.8 dB	67.6 dB	0.8 dB	61’	132’	285’	69’	148’	319’
Brentwood Blvd.	Technology to Village	100	66.7 dB	67.4 dB	0.7 dB	60’	129’	278’	68’	145’	313’
Brentwood Blvd.	Village to Central / Sycamore	100	66.3 dB	67.1 dB	0.8 dB	57’	122’	263’	64’	139’	299’
Brentwood Blvd.	South of Central / Sycamore	100	65.3 dB	66.2 dB	0.9 dB	49’	105’	227’	56’	121’	260’
Sand Creek Road	Brentwood to O'Hara	100	64.5 dB	65.4 dB	0.9 dB	43’	93’	200’	49’	107’	230’
Sand Creek Road	West of O'Hara	100	65.9 dB	66.6 dB	0.7 dB	53’	115’	248’	59’	128’	275’
O'Hara Ave.	Sand Creek to Saddle Creek	100	64.3 dB	64.3 dB	0.0 dB	42’	90’	194’	42’	90’	194’
Lone Tree	East of Brentwood	100	57.1 dB	57.1 dB	0.0 dB	14’	30’	64’	14’	30’	64’
Lone Tree	West of Brentwood	100	66.5 dB	66.9 dB	0.4 dB	58’	125’	269’	62’	135’	290’
Grant Street	West of Brentwood	100	59.9 dB	59.9 dB	0.0 dB	21’	46’	99’	21’	46’	99’
Sunset Road	East of Brentwood	100	63.1 dB	63.1 dB	0.0 dB	34’	74’	160’	34’	74’	160’
Havenwood Ave.	East of Brentwood	100	52.8 dB	52.8 dB	0.0 dB	7’	15’	33’	7’	15’	33’
Havenwood Ave.	West of Brentwood	100	50.9 dB	50.9 dB	0.0 dB	5’	11’	25’	5’	11’	25’
Sand Creek Road	East of Brentwood	100	54.6 dB	64.9 dB	**10.3 dB**	9’	20’	44’	45’	98’	211’
Central Blvd.	West of Brentwood	100	61.6 dB	62.0 dB	0.4 dB	27’	59’	127’	29’	63’	135’
Sycamore Ave.	East of Brentwood	100	60.0 dB	60.0 dB	0.0 dB	23’	49’	105’	23’	49’	105’

[1]Distances are reference distances from centerline of roadway.
Bold indicates traffic noise level increases greater than 4 dB.

Tables 9 and 10 data indicate that the proposed project would result in traffic noise level increases ranging from +0.1 dB to +16.1 dB under baseline or cumulative plus project conditions, when compared to baseline or cumulative no-project conditions. However, the traffic noise level increase along Sand Creek Road is due to a new roadway alignment through the project site. There are no existing receivers along this proposed alignment.

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

Future Noise-Producing Land Use Impact Assessment Methodology

There is a variety of noise sources associated with future development within the project area which has 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 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.

<u>Mechanical Equipment</u>

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.

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

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 11, 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 11 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 project is still in the tentative map stage, and shall be used during finalization of the project site plans.

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 1: **Impact of Increases of Traffic Noise Levels on Existing Land Uses.** Land uses 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 9 indicates that traffic noise level increases resulting from the proposed project would range from +0.1 dB to +16.1 dB Ldn, for baseline conditions relative to no-project conditions. Table 10 indicates that the cumulative traffic noise level increases resulting from the proposed project development would range from +0.1 dB to +10.3 dB Ldn, relative to no-project noise levels.

However, the only significant increase in traffic noise levels occurs along the Sand Creek Road extension. Currently there are no existing noise-sensitive receivers along the proposed roadway. **Therefore, this impact is considered less than significant**.

Mitigation for Impact 1: ***None Required***

Impact 2: **Impact of Traffic Noise at Future Noise-Sensitive Land Uses Developed on the Project Site.** Proposed future noise-sensitive land uses located adjacent to Brentwood Boulevard or Sand Creek Road 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 roadway. 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. 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.

The FHWA traffic noise prediction model was used to predict Cumulative Plus Project traffic noise levels at the proposed residential land uses associated with the project. Table 12 shows the predicted traffic noise levels at the proposed zoned residential uses which are adjacent to Brentwood Boulevard or Sand Creek Road. A distance of 50 feet from the potential property lines to the roadway centerlines plus 20 feet to the possible outdoor recreation area was used to determine exterior traffic noise impacts.

Table 12 Cumulative Project Traffic Noise Levels At Proposed Residential Uses				
Roadway	Segment	Possible Receiver Type[1]	Approximate Distance to Outdoor Activity Area[2]	Predicted Traffic Noise Levels, Ldn No Mitigation
Brentwood Blvd	Applewood to Sand Creek	LDR/MDR/ HDR	70'	**69.8 dB**
Sand Creek Rd	East of Brentwood	MDR/HDR	70'	**67.2 dB**

[1] LDR – Low Density Residential. MDR – Medium Density Residential. HDR – High Density Residential.
[2] A 70-foot distance to the outdoor activity area was applied to the FHWA.
Bold indicates predicted traffic noise levels greater than the 60 dB Ldn criteria.
Source: FHWA-RD-77-108 with inputs from Kimley Horn Associates, and j.c. brennan & associates, Inc.

Based upon the above analysis, traffic noise levels on Brentwood Boulevard from Applewood Common to Sand Creek Road and on Sand Creek Road east of Brentwood Boulevard are predicted to have traffic noise levels greater than the 60 dB Ldn exterior noise level standard on the project site where residential uses are proposed.

Mitigation measures can take many forms. Outdoor activity areas or patios can be shielded from traffic noise by locating them on the opposite sides of the building facades. Although the amount of shielding that can be expected varies based upon the site design and openings to the roadway. Another means of mitigating noise is to provide sound walls. Preliminary barrier calculations indicate that barrier heights of approximately 10-feet would be required along Brentwood Boulevard adjacent to residential uses. Barrier heights of approximately 7-feet would be required along Sand Creek Road.

Mitigation for Impact 2:

MM 2a: When tentative maps are available for the residential portions of the project site, a detailed analysis of traffic noise mitigation measures should be conducted.

Significance after Mitigation: Less than Significant.

Impact 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 Ldn 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.***

Mitigation for Impact 3:

Mitigation

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

MM 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 Table 12 under the cumulative + project scenarios.

MM 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 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.

Significance after Mitigation: Less than significant

Impact 4: **Impacts of Commercial 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 5:

MM 4a: Proposed Commercial Uses on the project site shall be required to comply with the Noise Element standards.

MM 4b: During project review, the Planning Director shall make a determination as to whether or not the proposed commercial 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 4c: Where commercial 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 4d*:** Where commercial 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 5: 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 5:

***MM 5a**:* 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 5b**:* Neighborhood parks should be limited to the daytime hours.

Significance after Mitigation: **Less than Significant**.

Impact 6: **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 11. 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 6:

MM 6a: Construction activities should adhere to the requirements of the City of Brentwood General Plan Noise Element with respect to hours of operation.

MM 6b: All equipment shall be fitted with factory equipped mufflers, and in good working order.

MM 6c: Staging areas for equipment and water trucks shall be located as far as possible from residential areas.

Significance after Mitigation: **Less than Significant**.

Impact 7: **Construction Vibration.** Construction of the Proposed Project could result in temporarily elevating vibration levels during construction. This would be a **potentially significant** impact.

The primary construction activities associated with the project would occur when the infrastructure such as buildings and utilities are constructed. Some construction could occur during occupancy of existing and future residential units, however, it is expected that they would occur at considerable distances from existing occupied residences and would be removed from future on-site uses. Comparing Table 2 which contains the criteria for acceptable vibration levels to Table 8, which shows potential vibration impacts, it is not expected that vibration impacts would occur which would cause any structural damage. **This impact is considered to be less than significant.**

Mitigation for Impact 7: **None required**

Appendix A
Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
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 B-1

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

Data Input Sheet

Project #: 2008-219 Sciortino Ranch
Description: Existing Traffic
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 Lone Tree	11,340	83		17	2	3	40	100	
2	Brentwood Blvd.	Lone Tree to Sunrise	14,010	83		17	2	3	40	100	
3	Brentwood Blvd.	Sunriset to Gregory	13,820	83		17	2	3	40	100	
4	Brentwood Blvd.	Gregory to Homecoming	13,710	83		17	2	3	40	100	
5	Brentwood Blvd.	Homecoming to Grant / Sunset	13,940	83		17	2	3	40	100	
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	14,640	83		17	2	3	40	100	
7	Brentwood Blvd.	Sunset Court to Havenwood	14,930	83		17	2	3	40	100	
8	Brentwood Blvd.	Havenwood to Applewood	14,950	83		17	2	3	40	100	
9	Brentwood Blvd.	Applewood to Sand Creek	15,620	83		17	2	3	40	100	
10	Brentwood Blvd.	Sand Creek to Technology	15,080	83		17	2	3	40	100	
11	Brentwood Blvd.	Technology to Village	15,450	83		17	2	3	40	100	
12	Brentwood Blvd.	Village to Central / Sycamore	14,640	83		17	2	3	40	100	
13	Brentwood Blvd.	South of Central / Sycamore	11,660	83		17	2	3	40	100	
14	Sand Creek Road	Brentwood to O'Hara	8,430	83		17	2	3	40	100	
15	Sand Creek Road	West of O'Hara	12,700	83		17	2	3	40	100	
16	O'Hara Ave.	Sand Creek to Saddle Creek	9,670	83		17	2	3	40	100	
17	Lone Tree	East of Brentwood	850	83		17	2	3	40	100	
18	Lone Tree	West of Brentwood	7,080	83		17	2	3	40	100	
19	Grant Street	West of Brentwood	2,320	83		17	2	3	40	100	
20	Sunset Road	East of Brentwood	5,390	83		17	2	3	40	100	
21	Havenwood Ave.	East of Brentwood	730	83		17	2	3	40	100	
22	Havenwood Ave.	West of Brentwood	200	83		17	2	3	40	100	
23	Sand Creek Road	East of Brentwood	340	83		17	2	3	40	100	
24	Central Blvd.	West of Brentwood	4,030	83		17	2	3	40	100	
25	Sycamore Ave.	East of Brentwood	4,300	83		17	2	3	40	100	

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Appendix B-2

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

Project #: 2008-219 Sciortino Ranch
Description: Existing Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Lone Tree	60.8	52.9	59.5	63.6
2	Brentwood Blvd.	Lone Tree to Sunrise	61.7	53.9	60.4	64.5
3	Brentwood Blvd.	Sunriset to Gregory	61.6	53.8	60.4	64.5
4	Brentwood Blvd.	Gregory to Homecoming	61.6	53.8	60.4	64.4
5	Brentwood Blvd.	Homecoming to Grant / Sunset	61.7	53.8	60.4	64.5
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	61.9	54.1	60.6	64.7
7	Brentwood Blvd.	Sunset Court to Havenwood	62.0	54.1	60.7	64.8
8	Brentwood Blvd.	Havenwood to Applewood	62.0	54.1	60.7	64.8
9	Brentwood Blvd.	Applewood to Sand Creek	62.2	54.3	60.9	65.0
10	Brentwood Blvd.	Sand Creek to Technology	62.0	54.2	60.8	64.8
11	Brentwood Blvd.	Technology to Village	62.1	54.3	60.9	64.9
12	Brentwood Blvd.	Village to Central / Sycamore	61.9	54.1	60.6	64.7
13	Brentwood Blvd.	South of Central / Sycamore	60.9	53.1	59.6	63.7
14	Sand Creek Road	Brentwood to O'Hara	59.5	51.7	58.2	62.3
15	Sand Creek Road	West of O'Hara	61.3	53.4	60.0	64.1
16	O'Hara Ave.	Sand Creek to Saddle Creek	60.1	52.2	58.8	62.9
17	Lone Tree	East of Brentwood	49.5	41.7	48.3	52.3
18	Lone Tree	West of Brentwood	58.7	50.9	57.5	61.6
19	Grant Street	West of Brentwood	53.9	46.0	52.6	56.7
20	Sunset Road	East of Brentwood	57.6	49.7	56.3	60.4
21	Havenwood Ave.	East of Brentwood	48.9	41.0	47.6	51.7
22	Havenwood Ave.	West of Brentwood	43.2	35.4	42.0	46.1
23	Sand Creek Road	East of Brentwood	45.6	37.7	44.3	48.4
24	Central Blvd.	West of Brentwood	56.3	48.4	55.0	59.1
25	Sycamore Ave.	East of Brentwood	56.6	48.7	55.3	59

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Appendix B-3

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

Project #: 2008-219 Sciortino Ranch
Description: Existing Traffic
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 Lone Tree	17	37	81	174	374
2	Brentwood Blvd.	Lone Tree to Sunrise	20	43	93	200	431
3	Brentwood Blvd.	Sunriset to Gregory	20	43	92	198	427
4	Brentwood Blvd.	Gregory to Homecoming	20	42	92	197	425
5	Brentwood Blvd.	Homecoming to Grant / Sunset	20	43	93	199	430
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	21	44	96	206	444
7	Brentwood Blvd.	Sunset Court to Havenwood	21	45	97	209	450
8	Brentwood Blvd.	Havenwood to Applewood	21	45	97	209	450
9	Brentwood Blvd.	Applewood to Sand Creek	22	46	100	215	464
10	Brentwood Blvd.	Sand Creek to Technology	21	45	98	210	453
11	Brentwood Blvd.	Technology to Village	21	46	99	214	460
12	Brentwood Blvd.	Village to Central / Sycamore	21	44	96	206	444
13	Brentwood Blvd.	South of Central / Sycamore	18	38	82	177	381
14	Sand Creek Road	Brentwood to O'Hara	14	31	66	143	307
15	Sand Creek Road	West of O'Hara	19	40	87	187	404
16	O'Hara Ave.	Sand Creek to Saddle Creek	16	34	73	156	337
17	Lone Tree	East of Brentwood	3	7	14	31	67
18	Lone Tree	West of Brentwood	13	27	59	127	274
19	Grant Street	West of Brentwood	6	13	28	60	130
20	Sunset Road	East of Brentwood	11	23	49	106	228
21	Havenwood Ave.	East of Brentwood	3	6	13	28	60
22	Havenwood Ave.	West of Brentwood	1	3	5	12	25
23	Sand Creek Road	East of Brentwood	2	4	8	17	36
24	Central Blvd.	West of Brentwood	9	19	40	87	188
25	Sycamore Ave.	East of Brentwood	9	20	42	91	196

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Appendix B-1

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

Project #: 2008-219 Sciortino Ranch
Description: Baseline Traffic
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 Lone Tree	13,120	83		17	2	3	40	100	
2	Brentwood Blvd.	Lone Tree to Sunrise	17,570	83		17	2	3	40	100	
3	Brentwood Blvd.	Sunriset to Gregory	17,640	83		17	2	3	40	100	
4	Brentwood Blvd.	Gregory to Homecoming	17,530	83		17	2	3	40	100	
5	Brentwood Blvd.	Homecoming to Grant / Sunset	17,760	83		17	2	3	40	100	
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	19,760	83		17	2	3	40	100	
7	Brentwood Blvd.	Sunset Court to Havenwood	20,040	83		17	2	3	40	100	
8	Brentwood Blvd.	Havenwood to Applewood	20,150	83		17	2	3	40	100	
9	Brentwood Blvd.	Applewood to Sand Creek	20,820	83		17	2	3	40	100	
10	Brentwood Blvd.	Sand Creek to Technology	18,430	83		17	2	3	40	100	
11	Brentwood Blvd.	Technology to Village	18,640	83		17	2	3	40	100	
12	Brentwood Blvd.	Village to Central / Sycamore	17,840	83		17	2	3	40	100	
13	Brentwood Blvd.	South of Central / Sycamore	14,330	83		17	2	3	40	100	
14	Sand Creek Road	Brentwood to O'Hara	10,660	83		17	2	3	40	100	
15	Sand Creek Road	West of O'Hara	14,930	83		17	2	3	40	100	
16	O'Hara Ave.	Sand Creek to Saddle Creek	9,670	83		17	2	3	40	100	
17	Lone Tree	East of Brentwood	850	83		17	2	3	40	100	
18	Lone Tree	West of Brentwood	8,860	83		17	2	3	40	100	
19	Grant Street	West of Brentwood	4,680	83		17	2	3	40	100	
20	Sunset Road	East of Brentwood	9,520	83		17	2	3	40	100	
21	Havenwood Ave.	East of Brentwood	730	83		17	2	3	40	100	
22	Havenwood Ave.	West of Brentwood	610	83		17	2	3	40	100	
23	Sand Creek Road	East of Brentwood	340	83		17	2	3	40	100	
24	Central Blvd.	West of Brentwood	4,710	83		17	2	3	40	100	
25	Sycamore Ave.	East of Brentwood	4,300	83		17	2	3	40	100	

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Appendix B-2

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

Project #: 2008-219 Sciortino Ranch
Description: Baseline Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Lone Tree	61.4	53.6	60.2	64.2
2	Brentwood Blvd.	Lone Tree to Sunrise	62.7	54.8	61.4	65.5
3	Brentwood Blvd.	Sunriset to Gregory	62.7	54.9	61.4	65.5
4	Brentwood Blvd.	Gregory to Homecoming	62.7	54.8	61.4	65.5
5	Brentwood Blvd.	Homecoming to Grant / Sunset	62.7	54.9	61.5	65.5
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	63.2	55.4	61.9	66.0
7	Brentwood Blvd.	Sunset Court to Havenwood	63.3	55.4	62.0	66.1
8	Brentwood Blvd.	Havenwood to Applewood	63.3	55.4	62.0	66.1
9	Brentwood Blvd.	Applewood to Sand Creek	63.4	55.6	62.2	66.2
10	Brentwood Blvd.	Sand Creek to Technology	62.9	55.1	61.6	65.7
11	Brentwood Blvd.	Technology to Village	62.9	55.1	61.7	65.8
12	Brentwood Blvd.	Village to Central / Sycamore	62.8	54.9	61.5	65.6
13	Brentwood Blvd.	South of Central / Sycamore	61.8	54.0	60.5	64.6
14	Sand Creek Road	Brentwood to O'Hara	60.5	52.7	59.3	63.3
15	Sand Creek Road	West of O'Hara	62.0	54.1	60.7	64.8
16	O'Hara Ave.	Sand Creek to Saddle Creek	60.1	52.2	58.8	62.9
17	Lone Tree	East of Brentwood	49.5	41.7	48.3	52.3
18	Lone Tree	West of Brentwood	59.7	51.9	58.5	62.5
19	Grant Street	West of Brentwood	56.9	49.1	55.7	59.8
20	Sunset Road	East of Brentwood	60.0	52.2	58.8	62.8
21	Havenwood Ave.	East of Brentwood	48.9	41.0	47.6	51.7
22	Havenwood Ave.	West of Brentwood	48.1	40.2	46.8	50.9
23	Sand Creek Road	East of Brentwood	45.6	37.7	44.3	48.4
24	Central Blvd.	West of Brentwood	57.0	49.1	55.7	59.8
25	Sycamore Ave.	East of Brentwood	56.6	48.7	55.3	59

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Appendix B-3

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

Project #: 2008-219 Sciortino Ranch
Description: Baseline Traffic
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 Lone Tree	19	41	89	192	413
2	Brentwood Blvd.	Lone Tree to Sunrise	23	50	108	233	501
3	Brentwood Blvd.	Sunriset to Gregory	23	50	108	233	503
4	Brentwood Blvd.	Gregory to Homecoming	23	50	108	232	501
5	Brentwood Blvd.	Homecoming to Grant / Sunset	23	50	109	234	505
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	25	54	117	252	542
7	Brentwood Blvd.	Sunset Court to Havenwood	25	55	118	254	547
8	Brentwood Blvd.	Havenwood to Applewood	25	55	118	255	549
9	Brentwood Blvd.	Applewood to Sand Creek	26	56	121	261	561
10	Brentwood Blvd.	Sand Creek to Technology	24	52	112	240	518
11	Brentwood Blvd.	Technology to Village	24	52	112	242	521
12	Brentwood Blvd.	Village to Central / Sycamore	24	51	109	235	506
13	Brentwood Blvd.	South of Central / Sycamore	20	44	94	203	438
14	Sand Creek Road	Brentwood to O'Hara	17	36	77	167	359
15	Sand Creek Road	West of O'Hara	21	45	97	209	450
16	O'Hara Ave.	Sand Creek to Saddle Creek	16	34	73	156	337
17	Lone Tree	East of Brentwood	3	7	14	31	67
18	Lone Tree	West of Brentwood	15	32	68	147	318
19	Grant Street	West of Brentwood	10	21	45	96	208
20	Sunset Road	East of Brentwood	15	33	72	155	333
21	Havenwood Ave.	East of Brentwood	3	6	13	28	60
22	Havenwood Ave.	West of Brentwood	2	5	11	25	53
23	Sand Creek Road	East of Brentwood	2	4	8	17	36
24	Central Blvd.	West of Brentwood	10	21	45	97	208
25	Sycamore Ave.	East of Brentwood	9	20	42	91	196

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Appendix B-1

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

Project #: 2008-219 Sciortino Ranch
Description: Baseline + Project Traffic
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 Lone Tree	15,680	83		17	2	3	40	100	
2	Brentwood Blvd.	Lone Tree to Sunrise	22,690	83		17	2	3	40	100	
3	Brentwood Blvd.	Sunriset to Gregory	22,760	83		17	2	3	40	100	
4	Brentwood Blvd.	Gregory to Homecoming	22,650	83		17	2	3	40	100	
5	Brentwood Blvd.	Homecoming to Grant / Sunset	22,880	83		17	2	3	40	100	
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	24,880	83		17	2	3	40	100	
7	Brentwood Blvd.	Sunset Court to Havenwood	25,160	83		17	2	3	40	100	
8	Brentwood Blvd.	Havenwood to Applewood	25,270	83		17	2	3	40	100	
9	Brentwood Blvd.	Applewood to Sand Creek	25,940	83		17	2	3	40	100	
10	Brentwood Blvd.	Sand Creek to Technology	22,920	83		17	2	3	40	100	
11	Brentwood Blvd.	Technology to Village	23,160	83		17	2	3	40	100	
12	Brentwood Blvd.	Village to Central / Sycamore	22,320	83		17	2	3	40	100	
13	Brentwood Blvd.	South of Central / Sycamore	18,170	83		17	2	3	40	100	
14	Sand Creek Road	Brentwood to O'Hara	13,860	83		17	2	3	40	100	
15	Sand Creek Road	West of O'Hara	18,130	83		17	2	3	40	100	
16	O'Hara Ave.	Sand Creek to Saddle Creek	9,670	83		17	2	3	40	100	
17	Lone Tree	East of Brentwood	850	83		17	2	3	40	100	
18	Lone Tree	West of Brentwood	11,420	83		17	2	3	40	100	
19	Grant Street	West of Brentwood	4,680	83		17	2	3	40	100	
20	Sunset Road	East of Brentwood	9,520	83		17	2	3	40	100	
21	Havenwood Ave.	East of Brentwood	730	83		17	2	3	40	100	
22	Havenwood Ave.	West of Brentwood	610	83		17	2	3	40	100	
23	Sand Creek Road	East of Brentwood	14,030	83		17	2	3	40	100	
24	Central Blvd.	West of Brentwood	5,350	83		17	2	3	40	100	
25	Sycamore Ave.	East of Brentwood	4,300	83		17	2	3	40	100	

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Appendix B-2

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

Project #: 2008-219 Sciortino Ranch
Description: Baseline + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Lone Tree	62.2	54.3	60.9	65.0
2	Brentwood Blvd.	Lone Tree to Sunrise	63.8	56.0	62.5	66.6
3	Brentwood Blvd.	Sunriset to Gregory	63.8	56.0	62.6	66.6
4	Brentwood Blvd.	Gregory to Homecoming	63.8	55.9	62.5	66.6
5	Brentwood Blvd.	Homecoming to Grant / Sunset	63.8	56.0	62.6	66.6
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	64.2	56.4	62.9	67.0
7	Brentwood Blvd.	Sunset Court to Havenwood	64.2	56.4	63.0	67.1
8	Brentwood Blvd.	Havenwood to Applewood	64.3	56.4	63.0	67.1
9	Brentwood Blvd.	Applewood to Sand Creek	64.4	56.5	63.1	67.2
10	Brentwood Blvd.	Sand Creek to Technology	63.8	56.0	62.6	66.7
11	Brentwood Blvd.	Technology to Village	63.9	56.0	62.6	66.7
12	Brentwood Blvd.	Village to Central / Sycamore	63.7	55.9	62.5	66.5
13	Brentwood Blvd.	South of Central / Sycamore	62.8	55.0	61.6	65.6
14	Sand Creek Road	Brentwood to O'Hara	61.7	53.8	60.4	64.5
15	Sand Creek Road	West of O'Hara	62.8	55.0	61.6	65.6
16	O'Hara Ave.	Sand Creek to Saddle Creek	60.1	52.2	58.8	62.9
17	Lone Tree	East of Brentwood	49.5	41.7	48.3	52.3
18	Lone Tree	West of Brentwood	60.8	53.0	59.6	63.6
19	Grant Street	West of Brentwood	56.9	49.1	55.7	59.8
20	Sunset Road	East of Brentwood	60.0	52.2	58.8	62.8
21	Havenwood Ave.	East of Brentwood	48.9	41.0	47.6	51.7
22	Havenwood Ave.	West of Brentwood	48.1	40.2	46.8	50.9
23	Sand Creek Road	East of Brentwood	61.7	53.9	60.5	64.5
24	Central Blvd.	West of Brentwood	57.5	49.7	56.3	60.3
25	Sycamore Ave.	East of Brentwood	56.6	48.7	55.3	59

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Appendix B-3

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

Project #: 2008-219 Sciortino Ranch
Description: Baseline + Project Traffic
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 Lone Tree	22	46	100	216	465
2	Brentwood Blvd.	Lone Tree to Sunrise	28	59	128	276	595
3	Brentwood Blvd.	Sunriset to Gregory	28	60	128	277	596
4	Brentwood Blvd.	Gregory to Homecoming	28	59	128	276	594
5	Brentwood Blvd.	Homecoming to Grant / Sunset	28	60	129	277	598
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	29	63	136	293	632
7	Brentwood Blvd.	Sunset Court to Havenwood	30	64	137	296	637
8	Brentwood Blvd.	Havenwood to Applewood	30	64	138	297	639
9	Brentwood Blvd.	Applewood to Sand Creek	30	65	140	302	650
10	Brentwood Blvd.	Sand Creek to Technology	28	60	129	278	599
11	Brentwood Blvd.	Technology to Village	28	60	130	280	603
12	Brentwood Blvd.	Village to Central / Sycamore	27	59	127	273	588
13	Brentwood Blvd.	South of Central / Sycamore	24	51	110	238	513
14	Sand Creek Road	Brentwood to O'Hara	20	43	92	199	428
15	Sand Creek Road	West of O'Hara	24	51	110	238	512
16	O'Hara Ave.	Sand Creek to Saddle Creek	16	34	73	156	337
17	Lone Tree	East of Brentwood	3	7	14	31	67
18	Lone Tree	West of Brentwood	17	38	81	175	376
19	Grant Street	West of Brentwood	10	21	45	96	208
20	Sunset Road	East of Brentwood	15	33	72	155	333
21	Havenwood Ave.	East of Brentwood	3	6	13	28	60
22	Havenwood Ave.	West of Brentwood	2	5	11	25	53
23	Sand Creek Road	East of Brentwood	20	43	93	200	432
24	Central Blvd.	West of Brentwood	11	23	49	105	227
25	Sycamore Ave.	East of Brentwood	9	20	42	91	196

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Appendix B-1

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

Project #: 2008-219 Sciortino Ranch
Description: Cumulative Traffic
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 Lone Tree	20,920	83		17	2	3	40	100	
2	Brentwood Blvd.	Lone Tree to Sunrise	24,010	83		17	2	3	40	100	
3	Brentwood Blvd.	Sunriset to Gregory	24,550	83		17	2	3	40	100	
4	Brentwood Blvd.	Gregory to Homecoming	24,190	83		17	2	3	40	100	
5	Brentwood Blvd.	Homecoming to Grant / Sunset	25,100	83		17	2	3	40	100	
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	27,310	83		17	2	3	40	100	
7	Brentwood Blvd.	Sunset Court to Havenwood	21,810	83		17	2	3	40	100	
8	Brentwood Blvd.	Havenwood to Applewood	22,340	83		17	2	3	40	100	
9	Brentwood Blvd.	Applewood to Sand Creek	22,610	83		17	2	3	40	100	
10	Brentwood Blvd.	Sand Creek to Technology	23,760	83		17	2	3	40	100	
11	Brentwood Blvd.	Technology to Village	22,930	83		17	2	3	40	100	
12	Brentwood Blvd.	Village to Central / Sycamore	21,110	83		17	2	3	40	100	
13	Brentwood Blvd.	South of Central / Sycamore	16,880	83		17	2	3	40	100	
14	Sand Creek Road	Brentwood to O'Hara	14,030	83		17	2	3	40	100	
15	Sand Creek Road	West of O'Hara	19,340	83		17	2	3	40	100	
16	O'Hara Ave.	Sand Creek to Saddle Creek	13,360	83		17	2	3	40	100	
17	Lone Tree	East of Brentwood	2,530	83		17	2	3	40	100	
18	Lone Tree	West of Brentwood	21,880	83		17	2	3	40	100	
19	Grant Street	West of Brentwood	4,840	83		17	2	3	40	100	
20	Sunset Road	East of Brentwood	10,010	83		17	2	3	40	100	
21	Havenwood Ave.	East of Brentwood	950	83		17	2	3	40	100	
22	Havenwood Ave.	West of Brentwood	610	83		17	2	3	40	100	
23	Sand Creek Road	East of Brentwood	1,440	83		17	2	3	40	100	
24	Central Blvd.	West of Brentwood	7,120	83		17	2	3	40	100	
25	Sycamore Ave.	East of Brentwood	5,350	83		17	2	3	40	100	

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Appendix B-2

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

Project #: 2008-219 Sciortino Ranch
Description: Cumulative Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Lone Tree	63.4	55.6	62.2	66.3
2	Brentwood Blvd.	Lone Tree to Sunrise	64.0	56.2	62.8	66.9
3	Brentwood Blvd.	Sunriset to Gregory	64.1	56.3	62.9	67.0
4	Brentwood Blvd.	Gregory to Homecoming	64.1	56.2	62.8	66.9
5	Brentwood Blvd.	Homecoming to Grant / Sunset	64.2	56.4	63.0	67.1
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	64.6	56.8	63.3	67.4
7	Brentwood Blvd.	Sunset Court to Havenwood	63.6	55.8	62.4	66.4
8	Brentwood Blvd.	Havenwood to Applewood	63.7	55.9	62.5	66.5
9	Brentwood Blvd.	Applewood to Sand Creek	63.8	55.9	62.5	66.6
10	Brentwood Blvd.	Sand Creek to Technology	64.0	56.2	62.7	66.8
11	Brentwood Blvd.	Technology to Village	63.8	56.0	62.6	66.7
12	Brentwood Blvd.	Village to Central / Sycamore	63.5	55.6	62.2	66.3
13	Brentwood Blvd.	South of Central / Sycamore	62.5	54.7	61.3	65.3
14	Sand Creek Road	Brentwood to O'Hara	61.7	53.9	60.5	64.5
15	Sand Creek Road	West of O'Hara	63.1	55.3	61.8	65.9
16	O'Hara Ave.	Sand Creek to Saddle Creek	61.5	53.7	60.2	64.3
17	Lone Tree	East of Brentwood	54.3	46.4	53.0	57.1
18	Lone Tree	West of Brentwood	63.6	55.8	62.4	66.5
19	Grant Street	West of Brentwood	57.1	49.2	55.8	59.9
20	Sunset Road	East of Brentwood	60.2	52.4	59.0	63.1
21	Havenwood Ave.	East of Brentwood	50.0	42.2	48.8	52.8
22	Havenwood Ave.	West of Brentwood	48.1	40.2	46.8	50.9
23	Sand Creek Road	East of Brentwood	51.8	44.0	50.6	54.6
24	Central Blvd.	West of Brentwood	58.8	50.9	57.5	61.6
25	Sycamore Ave.	East of Brentwood	57.5	49.7	56.3	60

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Appendix B-3

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

Project #: 2008-219 Sciortino Ranch
Description: Cumulative Traffic
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 Lone Tree	26	56	121	261	563
2	Brentwood Blvd.	Lone Tree to Sunrise	29	62	133	287	617
3	Brentwood Blvd.	Sunriset to Gregory	29	63	135	291	627
4	Brentwood Blvd.	Gregory to Homecoming	29	62	134	288	620
5	Brentwood Blvd.	Homecoming to Grant / Sunset	30	64	137	295	636
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	31	67	145	312	673
7	Brentwood Blvd.	Sunset Court to Havenwood	27	58	125	269	579
8	Brentwood Blvd.	Havenwood to Applewood	27	59	127	273	588
9	Brentwood Blvd.	Applewood to Sand Creek	28	59	128	275	593
10	Brentwood Blvd.	Sand Creek to Technology	28	61	132	285	613
11	Brentwood Blvd.	Technology to Village	28	60	129	278	599
12	Brentwood Blvd.	Village to Central / Sycamore	26	57	122	263	567
13	Brentwood Blvd.	South of Central / Sycamore	23	49	105	227	488
14	Sand Creek Road	Brentwood to O'Hara	20	43	93	200	432
15	Sand Creek Road	West of O'Hara	25	53	115	248	534
16	O'Hara Ave.	Sand Creek to Saddle Creek	19	42	90	194	418
17	Lone Tree	East of Brentwood	6	14	30	64	138
18	Lone Tree	West of Brentwood	27	58	125	269	580
19	Grant Street	West of Brentwood	10	21	46	99	212
20	Sunset Road	East of Brentwood	16	34	74	160	345
21	Havenwood Ave.	East of Brentwood	3	7	15	33	72
22	Havenwood Ave.	West of Brentwood	2	5	11	25	53
23	Sand Creek Road	East of Brentwood	4	9	20	44	95
24	Central Blvd.	West of Brentwood	13	27	59	127	275
25	Sycamore Ave.	East of Brentwood	11	23	49	105	227

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Appendix B-1

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

Project #: 2008-219 Sciortino Ranch
Description: Cumulative + Project Traffic
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 Lone Tree	23,480	83		17	2	3	40	100	
2	Brentwood Blvd.	Lone Tree to Sunrise	29,130	83		17	2	3	40	100	
3	Brentwood Blvd.	Sunriset to Gregory	29,670	83		17	2	3	40	100	
4	Brentwood Blvd.	Gregory to Homecoming	29,310	83		17	2	3	40	100	
5	Brentwood Blvd.	Homecoming to Grant / Sunset	30,220	83		17	2	3	40	100	
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	32,430	83		17	2	3	40	100	
7	Brentwood Blvd.	Sunset Court to Havenwood	26,930	83		17	2	3	40	100	
8	Brentwood Blvd.	Havenwood to Applewood	27,460	83		17	2	3	40	100	
9	Brentwood Blvd.	Applewood to Sand Creek	27,730	83		17	2	3	40	100	
10	Brentwood Blvd.	Sand Creek to Technology	28,250	83		17	2	3	40	100	
11	Brentwood Blvd.	Technology to Village	27,450	83		17	2	3	40	100	
12	Brentwood Blvd.	Village to Central / Sycamore	25,590	83		17	2	3	40	100	
13	Brentwood Blvd.	South of Central / Sycamore	20,720	83		17	2	3	40	100	
14	Sand Creek Road	Brentwood to O'Hara	17,230	83		17	2	3	40	100	
15	Sand Creek Road	West of O'Hara	22,540	83		17	2	3	40	100	
16	O'Hara Ave.	Sand Creek to Saddle Creek	13,360	83		17	2	3	40	100	
17	Lone Tree	East of Brentwood	2,530	83		17	2	3	40	100	
18	Lone Tree	West of Brentwood	24,440	83		17	2	3	40	100	
19	Grant Street	West of Brentwood	4,840	83		17	2	3	40	100	
20	Sunset Road	East of Brentwood	10,010	83		17	2	3	40	100	
21	Havenwood Ave.	East of Brentwood	950	83		17	2	3	40	100	
22	Havenwood Ave.	West of Brentwood	610	83		17	2	3	40	100	
23	Sand Creek Road	East of Brentwood	15,130	83		17	2	3	40	100	
24	Central Blvd.	West of Brentwood	7,760	83		17	2	3	40	100	
25	Sycamore Ave.	East of Brentwood	5,350	83		17	2	3	40	100	

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Appendix B-2

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

Project #: 2008-219 Sciortino Ranch
Description: Cumulative + Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Brentwood Blvd.	North of Lone Tree	63.9	56.1	62.7	66.8
2	Brentwood Blvd.	Lone Tree to Sunrise	64.9	57.0	63.6	67.7
3	Brentwood Blvd.	Sunriset to Gregory	65.0	57.1	63.7	67.8
4	Brentwood Blvd.	Gregory to Homecoming	64.9	57.1	63.7	67.7
5	Brentwood Blvd.	Homecoming to Grant / Sunset	65.0	57.2	63.8	67.9
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	65.3	57.5	64.1	68.2
7	Brentwood Blvd.	Sunset Court to Havenwood	64.5	56.7	63.3	67.4
8	Brentwood Blvd.	Havenwood to Applewood	64.6	56.8	63.4	67.4
9	Brentwood Blvd.	Applewood to Sand Creek	64.7	56.8	63.4	67.5
10	Brentwood Blvd.	Sand Creek to Technology	64.7	56.9	63.5	67.6
11	Brentwood Blvd.	Technology to Village	64.6	56.8	63.4	67.4
12	Brentwood Blvd.	Village to Central / Sycamore	64.3	56.5	63.1	67.1
13	Brentwood Blvd.	South of Central / Sycamore	63.4	55.6	62.1	66.2
14	Sand Creek Road	Brentwood to O'Hara	62.6	54.8	61.3	65.4
15	Sand Creek Road	West of O'Hara	63.8	55.9	62.5	66.6
16	O'Hara Ave.	Sand Creek to Saddle Creek	61.5	53.7	60.2	64.3
17	Lone Tree	East of Brentwood	54.3	46.4	53.0	57.1
18	Lone Tree	West of Brentwood	64.1	56.3	62.9	66.9
19	Grant Street	West of Brentwood	57.1	49.2	55.8	59.9
20	Sunset Road	East of Brentwood	60.2	52.4	59.0	63.1
21	Havenwood Ave.	East of Brentwood	50.0	42.2	48.8	52.8
22	Havenwood Ave.	West of Brentwood	48.1	40.2	46.8	50.9
23	Sand Creek Road	East of Brentwood	62.0	54.2	60.8	64.9
24	Central Blvd.	West of Brentwood	59.1	51.3	57.9	62.0
25	Sycamore Ave.	East of Brentwood	57.5	49.7	56.3	60

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Appendix B-3

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

Project #: 2008-219 Sciortino Ranch
Description: Cumulative + Project Traffic
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 Lone Tree	28	61	131	282	608
2	Brentwood Blvd.	Lone Tree to Sunrise	33	70	151	326	702
3	Brentwood Blvd.	Sunriset to Gregory	33	71	153	330	711
4	Brentwood Blvd.	Gregory to Homecoming	33	71	152	327	705
5	Brentwood Blvd.	Homecoming to Grant / Sunset	33	72	155	334	720
6	Brentwood Blvd.	Grant / Sunset to Sunset Court	35	75	163	350	754
7	Brentwood Blvd.	Sunset Court to Havenwood	31	67	144	309	666
8	Brentwood Blvd.	Havenwood to Applewood	31	68	145	313	675
9	Brentwood Blvd.	Applewood to Sand Creek	32	68	146	315	680
10	Brentwood Blvd.	Sand Creek to Technology	32	69	148	319	688
11	Brentwood Blvd.	Technology to Village	31	68	145	313	675
12	Brentwood Blvd.	Village to Central / Sycamore	30	64	139	299	644
13	Brentwood Blvd.	South of Central / Sycamore	26	56	121	260	560
14	Sand Creek Road	Brentwood to O'Hara	23	49	107	230	495
15	Sand Creek Road	West of O'Hara	27	59	128	275	592
16	O'Hara Ave.	Sand Creek to Saddle Creek	19	42	90	194	418
17	Lone Tree	East of Brentwood	6	14	30	64	138
18	Lone Tree	West of Brentwood	29	62	135	290	625
19	Grant Street	West of Brentwood	10	21	46	99	212
20	Sunset Road	East of Brentwood	16	34	74	160	345
21	Havenwood Ave.	East of Brentwood	3	7	15	33	72
22	Havenwood Ave.	West of Brentwood	2	5	11	25	53
23	Sand Creek Road	East of Brentwood	21	45	98	211	454
24	Central Blvd.	West of Brentwood	13	29	63	135	291
25	Sycamore Ave.	East of Brentwood	11	23	49	105	227

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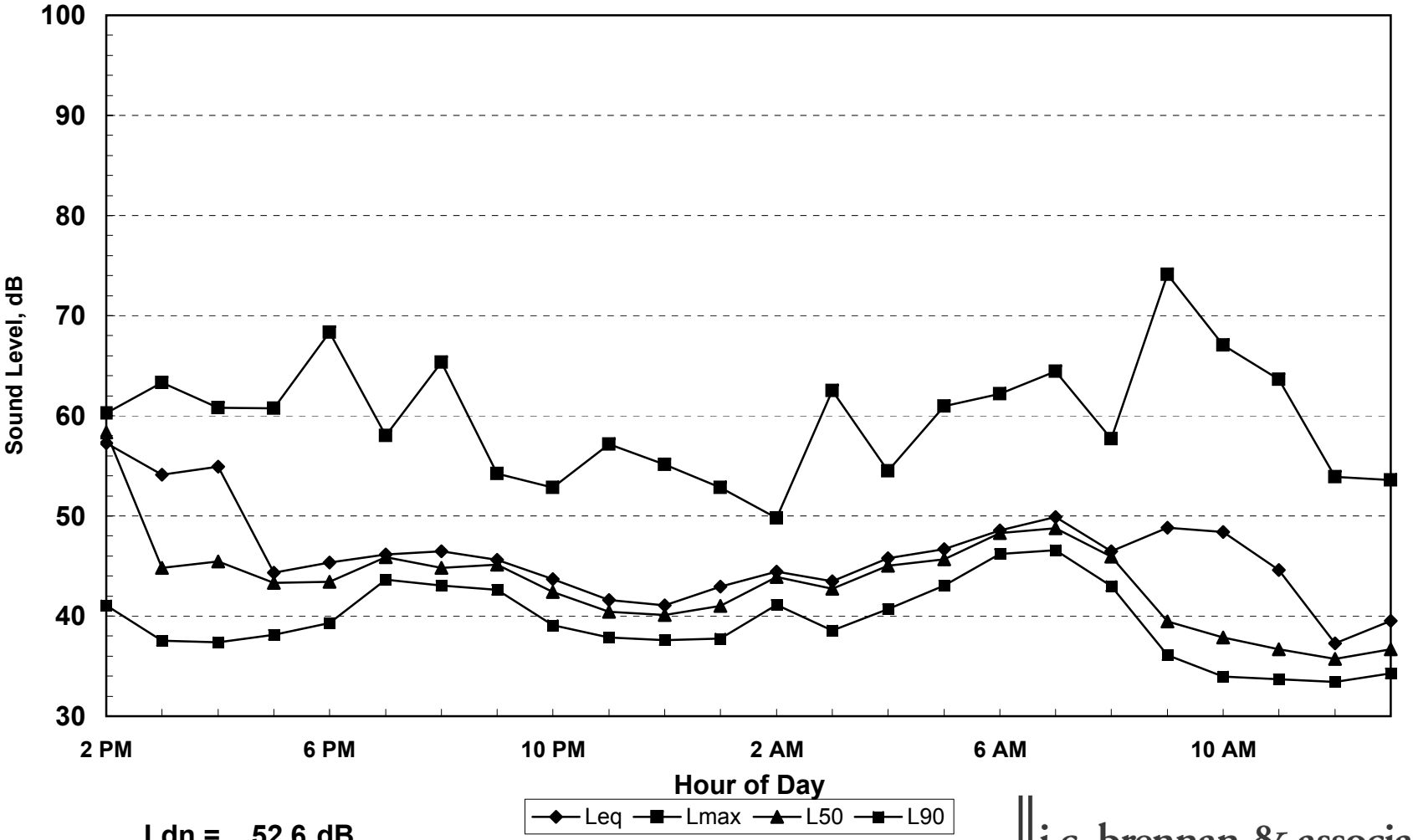
Appendix C
24hr Continuous Noise Monitoring, Site A
Sciortino Ranch
October 28-29, 2008



Ldn = 52.6 dB

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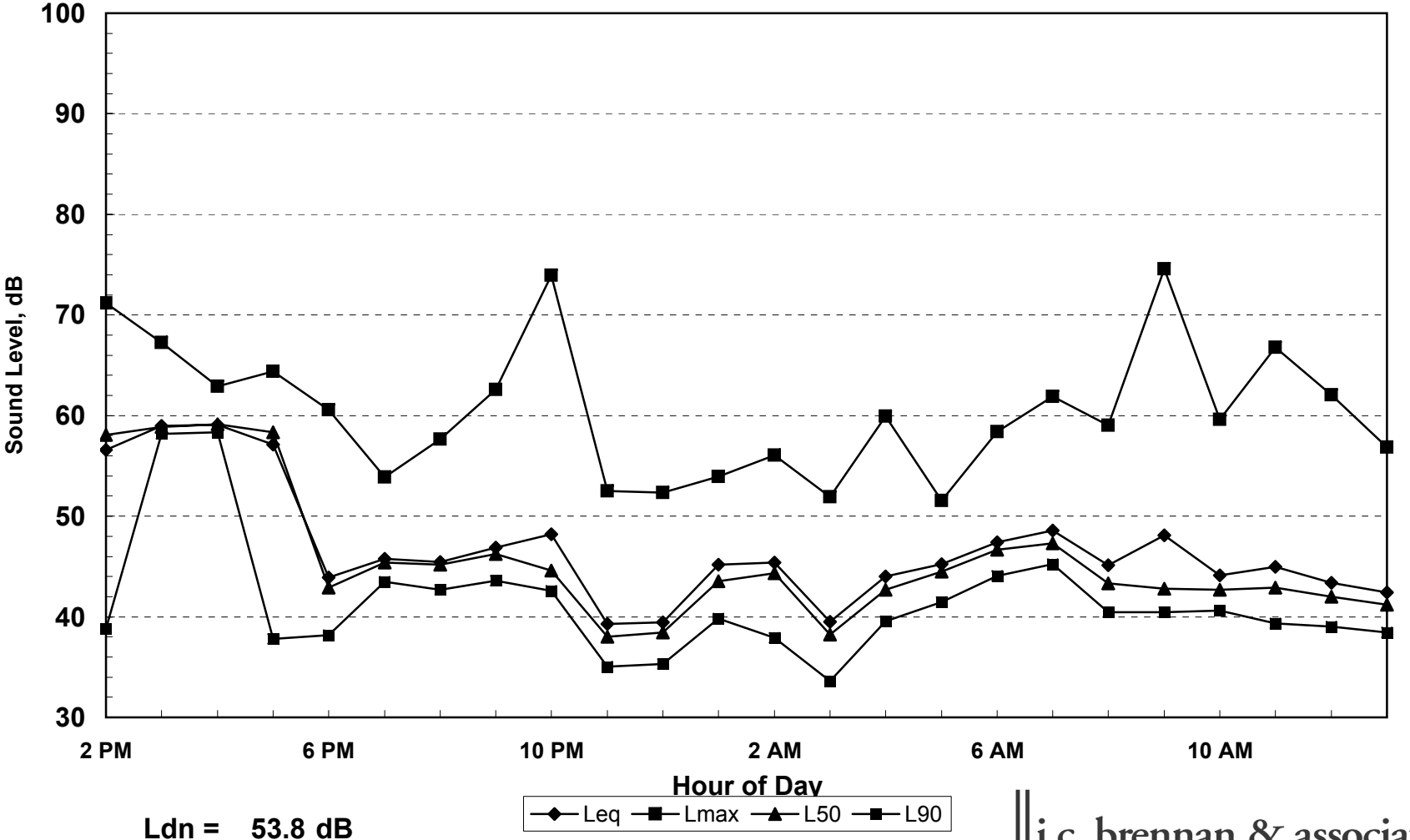
Appendix C
24hr Continuous Noise Monitoring, Site A
Sciortino Ranch
October 29-30, 2008



Ldn = 53.8 dB

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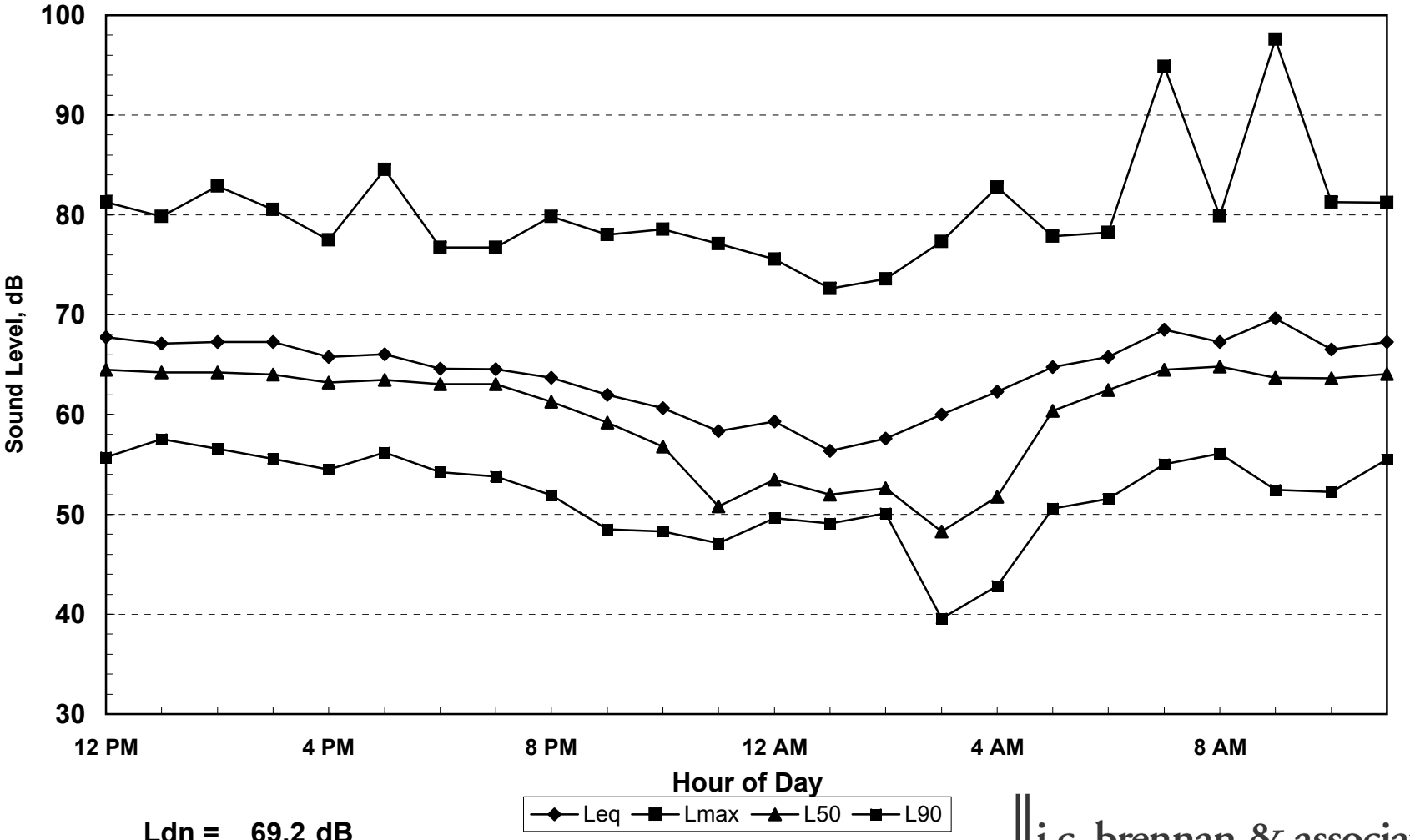
Appendix C
24hr Continuous Noise Monitoring, Site B
Sciortino Ranch
August 1-2, 2007



Ldn = 69.2 dB

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Appendix D

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2008-219
Description Cumulative Plus Project at Residential Uses
Roadway Name: Brentwood Boulevard
Location(s): 1

Noise Level Data:

Year: 2025
Auto L_{dn}, dB: 67
Medium Truck L_{dn}, dB: 59
Heavy Truck L_{dn}, dB: 66

Site Geometry:

Receiver Description: Applewood to Sand Creek
Centerline to Barrier Distance (C_1): 45
Barrier to Receiver Distance (C_2): 25
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 0
Receiver Elevation[1]: 5
Base of Barrier Elevation: 0
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	---------- L_{dn}, dB ---------- Autos	Medium Trucks	Heavy Trucks	Total	Barrier Breaks Line of Sight to… Autos?	Medium Trucks?	Heavy Trucks?
6	6	60	53	61	**64**	Yes	Yes	No
7	7	59	52	61	**63**	Yes	Yes	Yes
8	8	58	51	60	**62**	Yes	Yes	Yes
9	9	57	50	59	**61**	Yes	Yes	Yes
10	10	56	49	57	**60**	Yes	Yes	Yes
11	11	55	48	56	**59**	Yes	Yes	Yes
12	12	54	47	55	**58**	Yes	Yes	Yes
13	13	54	46	55	**57**	Yes	Yes	Yes
14	14	53	46	54	**57**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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Appendix D

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2008-219 Scoirtino Ranch
Description Cumulative Plus Project at Residential Uses
Roadway Name: Sand Creek Rd
Location(s): 2

Noise Level Data:

Year: 2025
Auto L_{dn}, dB: 64
Medium Truck L_{dn}, dB: 57
Heavy Truck L_{dn}, dB: 63

Site Geometry:

Receiver Description: East of Brentwood Blvd
Centerline to Barrier Distance (C_1): 45
Barrier to Receiver Distance (C_2): 25
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 0
Receiver Elevation[1]: 5
Base of Barrier Elevation: 0
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	---------- L_{dn}, dB ---------- Autos	Medium Trucks	Heavy Trucks	Total	Barrier Breaks Line of Sight to… Autos?	Medium Trucks?	Heavy Trucks?
6	6	57	50	58	**61**	Yes	Yes	No
7	7	56	49	58	**60**	Yes	Yes	Yes
8	8	55	48	57	**60**	Yes	Yes	Yes
9	9	54	47	56	**58**	Yes	Yes	Yes
10	10	53	46	55	**58**	Yes	Yes	Yes
11	11	52	45	54	**56**	Yes	Yes	Yes
12	12	52	44	53	**56**	Yes	Yes	Yes
13	13	51	44	52	**55**	Yes	Yes	Yes
14	14	50	43	51	**54**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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APPENDIX G

BIOLOGICAL RESOURCES ANALYSIS
SCIORTINO MIXED USE DEVELOPMENT
BRENTWOOD, CONTRA COSTA COUNTY, CALIFORNIA

October 2006

Prepared for:

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SUMMARY

This report describes the biological resources analysis conducted by Mosaic Associates biologists Amy Richey and Judy Bendix of the approximately 65-acre Sciortino property, located in Brentwood, east of Brentwood Boulevard at Sand Creek Road (Figure 1). The property has been proposed for mixed-use development. This report documents the findings of a field assessment, provides an analysis of potential impacts of the project on biological resources, proposes mitigation measures, and makes recommendations on the need for further surveys prior to site disturbance. It was prepared under contract with DeNova Homes.

DeNova Homes has proposed the construction of two large retail facilities, a business/light industrial parcel, and high-density residential development on the Sciortino property. The proposed project is featured on the Conceptual Site Plan, Sciortino Property (Carlson, Barbee & Gibson, Inc., September 22, 2006, Figure 2). The project site, located northeast of downtown Brentwood, is rectangular and nearly flat. Residential development is present to the north and south, and under construction to the east. Commercial development is present to the west. Although presently fallow, most of the site was subject to intensive agricultural production until relatively recently (Figure 3).

The site is dominated by non-native ruderal vegetation. A group of trees are located near an old homesite just east of the Brentwood Boulevard and Sand Creek Road intersection. Two abandoned tractor trailers are present near the trees. A natural gas pumping facility is located in the northeast corner of the site.

Focused botanical surveys of the Sand Creek Road alignment that bisects the site were conducted during 2005 for the Barrington residential development (Wood Biological, August 10, 2005, Appendix D). No rare plant species were detected during that survey, and based on the extremely limited botanical diversity and uniform conditions across the Sciortino study area, no further botanical surveys are warranted. A list of species with potential to occur in the project vicinity is contained in Appendix B.

Although the site is highly disturbed, the fallow fields, group of tall trees, and ground squirrel burrows provide suitable habitat for several special-status animals. Thirty-one special-status species known from the project area were evaluated to determine the presence of suitable habitat and potential to occur in the study area (Appendix C).

The ground squirrel burrows in the fallow fields of the project site provide suitable nesting habitat for the burrowing owl (*Athene cunicularia*), a California Species of Special Concern. One burrowing owl was observed during the September 27 site visit and two individuals were observed by Mosaic biologists on the property in February and March 2006 during surveys conducted for the Barrington project. Those owls did not nest on site, probably due to the height of the vegetation, which exceeded six feet during the spring and early summer. Ground squirrel burrows suitable for burrowing owls are present across the site.

Perimeter areas of the study area where vegetation is sparser provide marginal nesting habitat for the California horned lark (*Eremophila alpestris actia*), a California Species of Special Concern.

The trees surrounding the old residential site at the southwest corner of the roadway alignment provide suitable nesting habitat for Swainson's hawk (*Buteo swainsoni*), state threatened, although the recent development of agricultural fields surrounding the site has substantially reduced foraging habitat for this species. Furthermore, no Swainson's hawks were observed during focused surveys conducted in 2006 for the Barrington project, which encompassed the Sciortino property (Mosaic Associates, April 27, 2006).

The on-site trees also provide marginal nesting habitat for the white-tailed kite (*Elanus leucurus*) a California Species of Special Concern and fully protected species, while the smaller trees and shrubs in this area provide suitable nesting habitat for loggerhead shrike (*Lanius ludovicianus*), a California Species of Special Concern. Two loggerhead shrikes were observed during our site visit.

The fallow field and trees in the study area also provide habitat for other ground and tree-nesting avian species protected by the Migratory Bird Treaty Act.

Potential impacts of the project and suggested mitigation measures are listed below. Potential impacts of the project would be rendered less-than-significant with implementation of the mitigation measures described below.

Impacts to Special-status Plants

Potential Impact. The project proposes to convert habitat across the site to developed uses. Thirty-three special-status plant species occurring in the region surrounding the project were assessed for their potential to occur on site. However, due to the highly disturbed nature of the site and absence of special-status species in focused botanical surveys of the Sand Creek Road alignment conducted in 2005, suitable habitat for these species is absent, and there is no potential for special-status plant species to occur within the project site. Therefore, no impacts to special-status plants are expected.

Mitigation Measure. None required.

Impacts to Burrowing Owl

Impact 1. A burrowing owl was present on site in September 2006, and two were observed in February and March 2006. Construction of the project has the potential to result in a "take" of burrowing owls if they are present on site at the time of construction, and would result in the loss of occupied burrowing owl habitat. This would be considered a significant impact. Impacts would be rendered less-than-significant with implementation of the following mitigation measures.

Mitigation Measure 1.1 Surveys for burrowing owls shall be conducted during the height of the nesting season, between April 15 and July 15 in accordance with the survey requirements detailed in the California Department of Fish andGame (CDFG) 1995 *Staff Report on Burrowing Owl* and the California Burrowing Owl Consortium's (CBOC) Survey Protocol (1997). The survey shall be conducted by a qualified biologist to determine the number of

burrowing owls present during the nesting season. Completion of the nesting season surveys does not exempt the applicant from conduct of preconstruction surveys if site disturbance does not commence within 30 days of the nesting season surveys.

Mitigation Measure 1.2 If site disturbance commences during the nesting season (between February 1 and August 31) and burrowing owls are detected on or within 250-feet of the site, a fenced buffer shall be erected not less than 250-feet between the nest burrow(s) and construction activities. The 250-foot buffer shall be observed and the fence left intact until a qualified biologist determines that the young are foraging independently, the nest has failed, or the owls are no longer using any burrows within the buffer.

Mitigation Measure 1.3 To offset the loss of foraging and burrow habitat on the project site, a minimum of 6.5 acres of nesting and foraging habitat per pair or unpaired resident bird must be acquired and permanently protected. Mitigation shall be consistent with the CDFG Staff Report (1995). Off-site mitigation can be provided at an approved conservation bank, or on other lands protected by a conservation easement and managed subject to a burrowing owl management plan prepared by a qualified burrowing owl biologist.

Mitigation Measure 1.4 Surveys performed consistent with the CBOC protocol shall be conducted not less than 30 days prior to site disturbance. If site disturbance commences outside of the nesting season, and burrowing owl(s) are present on site or within 160 feet of site disturbance, passive relocation consistent with the CDFG Staff Report (1995) and the CBOC Survey Protocol (1997) shall be performed. At least one or more weeks will be necessary to accomplish this and allow the owls to acclimate to alternate burrows The preconstruction surveys shall be repeated if more than 30 days elapse between the last survey and the start of construction activities.

Impacts to Swainson's Hawk

Impact 2. The trees on site provide suitable nesting habitat for Swainson's hawk, although the potential for this species to nest on site is low given the limited area of foraging habitat in the vicinity of the study area. Construction of the project has the potential to disrupt nesting behavior if occupied nests are present on or near the site. This would be considered a significant impact. Impacts would be rendered less-than-significant with implementation of the following mitigation measures.

Mitigation Measure 2.1. If construction is proposed by the developer during the nesting season (February-August), a pre-construction survey for active Swainson's hawk nests shall be conducted within a 0.5-mile radius of the study area by a qualified biologist in a manner consistent with the survey protocol developed by the Swainson's Hawk Technical Advisory Committee (May 31, 2000). If no active nests are found during the pre-construction survey, no further action is required. If active nests are found, the findings will be submitted to CDFG and a buffer zone of a minimum of one-quarter mile (approximately 1300 feet) shall be established around the active nest. Intensive new disturbances (e.g., heavy equipment activities associated with construction) that may cause nest abandonment or forced fledging shall not be initiated within this buffer zone between March 1 and September 1. Any trees

containing nests that must be removed as a result of project implementation shall be removed during the non-breeding season (September to January).

Mitigation Measure 2.2. The developer shall be responsible for mitigating the loss of Swainson's hawk foraging habitat on the Sciortino study area if an active nest is detected within 0.5 mile of the site. The type and amount of mitigation, if necessary, shall be determined by the City with technical assistance from CDFG.

Impacts to Nesting Raptors and Other Migratory Birds

Impact 3. The trees and ruderal vegetation on site provide suitable nesting habitat for several special-status species including California horned lark, loggerhead shrike, white-tailed kite and other migratory birds. Construction of the project has the potential to cause the failure of occupied nests. This would be considered a significant impact. Impacts would be rendered less-than-significant with implementation of the following mitigation measure.

Mitigation Measure 3. If site disturbance commences during the nesting season (February 1 – August 15), a preconstruction survey shall be conducted by a qualified wildlife biologist within 15 days of the start of project-related activities. If nests of migratory birds are detected on site or within 75 feet (for migratory passerine birds) or 250-feet (for birds of prey) of the site, the applicant shall observe no-disturbance buffers of 75 feet for migratory passerine and 250 feet for birds of preys until August 15, or the qualified biologist determines that the young are foraging independently, or the nest has been abandoned.

Impacts to Special-status Natural Communities

Potential Impact. No special-status natural communities are present on the project site and thus no impacts are anticipated.

Mitigation Measure. None required.

Interference with the Movement of Native Wildlife

Potential Impact. The site is not situated within an apparent "movement corridor" for native wildlife, although some species may move within and through it. Site development will have a negligible effect on home range and dispersal movements of native wildlife present in the site vicinity. Therefore, the project will result in a less-than-significant effect on the movements of native wildlife.

Mitigation. None required.

Conflict with Local Policies and Ordinances

Potential Impact. The City of Brentwood has adopted Goals and Policies regarding the protection of natural resources in the Brentwood Planning Area. The project proposes the conversion fallow farmland to residential and commercial development. While the ruderal

vegetation on site does provide habitat for a number of animals, the proposed project does not conflict with local policies or ordinances adopted for the Brentwood Planning Area.

Mitigation. None required.

BIOLOGICAL RESOURCES ANALYSIS
SCIORTINO MIXED USE DEVELOPMENT
BRENTWOOD, CONTRA COSTA COUNTY, CALIFORNIA

1.0 INTRODUCTION

This report describes the biological resources analysis conducted by Mosaic Associates biologists Amy Richey and Judy Bendix of the approximately 65-acre Sciortino property, located in Brentwood, east of Brentwood Boulevard at Sand Creek Road (Figure 1). The property has been proposed for mixed-use development. This report documents the findings of a field assessment, provides an analysis of potential impacts of the project on biological resources, proposes mitigation measures, and makes recommendations on the need for further surveys prior to site disturbance. It was prepared under contract with DeNova Homes.

DeNova Homes has proposed the construction of two large retail facilities, a business/light industrial parcel, and high-density residential development on the Sciortino property. The proposed project is featured on the Conceptual Site Plan, Sciortino Property (Carlson, Barbee & Gibson, Inc., September 22, 2006, Figure 2). The project site, located northeast of downtown Brentwood, is rectangular and nearly flat. Although presently fallow, most of the site was subject to intensive agricultural production until relatively recently (Figure 3).

2.0 METHODS

Judy Bendix and Amy Richey of Mosaic Associates conducted a reconnaissance-level survey by walking a series of meandering transects across the project site on September 27, 2006. Habitat types, significant features, and surrounding land uses were noted. Several photos of the site were taken (Appendix A). The potential of the site to support special-status species (Appendices B and C) was assessed. In addition to this site assessment, focused botanical surveys of the Sand Creek Road alignment across the site were conducted in 2005 in association with the Barrington residential development (Wood Biological 2005, Appendix D).

Sources of information used in the preparation of this analysis include the *California Natural Diversity Data Base* (CDFG 2006), the *California Native Plant Society Inventory of Rare and Endangered Vascular Plants* (2001), manuals and references related to plants and animals of the region (CDFG 2003a,b,c,d,e) and reports prepared for other projects in the region. Potential impacts to biological resources and proposed mitigation measures are based on the project description derived from site development plans and discussions with DeNova Homes.

3.0 SETTING

The Sciortino property study area occupies approximately 65 acres of nearly flat agricultural land in Brentwood (Figure 3). The project site is located east of the Brentwood Boulevard at the

Sand Creek Road intersection. Surrounding land uses include commercial and residential development. Construction of the Barrington residential development by Standard Pacific Homes is underway on the property east of the project site.

Although presently fallow, the study area was previously used for intensive agricultural production. At the time of the reconnaissance survey, approximately eighty percent of the site consisted of fallow cropland. The remainder of the site was occupied by structures and supported limited vegetation. One group of tall trees surrounds a former home site. The perimeter of the study area was disked during the summer of 2006 to abate fire hazard and vegetative cover in the disked strip was therefore limited. A excavated pit, approximately 15 feet wide and 80 feet long, and used as a dump site by area residents, is located along the east side of the property. This pit was probably used in the past to receive agricultural tailwater, but is not connected to any surface waterway.

Structures present within the study area include natural gas pumping station enclosed in a chain-link fence in the northeast corner of the property, and two temporary trailers near the former home site.

3.1 Vegetation Communities And Wildlife Habitat

Due to the recent use of the site for agriculture, the entire project site is highly disturbed, and as a result, is dominated by ruderal vegetation. Vegetation types are described in more detail below.

3.1.1 Ruderal Habitat in Fallow Agricultural Fields

Ruderal habitat is that from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. Once abandoned, such areas are typically recolonized by invasive exotic species. The native vegetation may ultimately become at least partially restored if the soils are left intact and there is no further disturbance. Ruderal habitat is not specifically described by Sawyer and Keeler-Wolf (1995) and would be classified as upland following Cowardin, *et al.* (1979).

Ruderal species occupy areas within the project site that had not been disked in the months prior to the site reconnaissance. The excavated pit near the east side of the property is also dominated by ruderal species. Scattered plants are also found within the disked portion of the site, although to a much lesser extent. Ruderal habitat is present in nearly all the site where it is not disturbed by disking or road construction activities.

Plant species present on site included dense stands of the non-native grasses wild oat (*Avena fatua*), and ripgut brome (*Bromus diandrus*); and mixed stands of milk thistle (*Silybum marianum*) and Italian thistle (*Carduus pycnocephalus*). Other species present included black mustard (*Brassica nigra*), goosefoot (*Chenopodium album*) field bindweed (*Convovulus arvensis*), common malva (*Malva neglecta*), and Russian thistle (*Salsola tragus*).

Despite the high level of disturbance, the areas dominated by ruderal vegetation provide habitat for a number of wildlife species, including small mammals such as California vole (*Microtus*

californicus), western harvest mice (*Reithrodontomys megalotis*), deer mice (*Peromyscus maniculatus*), and California ground squirrels (*Spermophilus beecheyi*). These rodents in turn serve as prey for various raptors such as red-tail hawk (*Buteo jamaicensis*) and barn owls (*Tyto alba*) as well as coyotes (*Canis latrans*).

Birds observed during the site survey included western scrub jay *(Aphelocoma californica)*, red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), Say's phoebe (*Sayornis saya*), and European starling (*Sturnus vulgaris*). Special-status birds observed include a single burrowing owl in the southern area of the site, and two loggerhead shrikes (*Lanius ludovicianus*). Mammals include jackrabbits (*Lepus californicus*) and ground squirrels.

3.1.2. Developed Areas

An old home site is located east of Brentwood Boulevard and south of the new alignment of Sand Creek Road. Although the structure itself is no longer present, several large trees form a stand at the former home site. These include white alder (*Alnus rhombifolia*) and English walnut (*Juglans regia*). Two abandoned truck trailers are present.

Additionally, there is a natural gas pump station located in the northeast corner of the site. This pumping station, installed in 1996, was operating at the time of the survey. The pump equipment is surrounded by a paved and gravelled yard and fringed with oleander (*Nerium oleander*) shrubs.

An extension of Sand Creek Road east of its present terminus at Brentwood Boulevard is under construction, roughly bisecting the study area. Rough grading had been completed at the time of the site visit.

4.0 SPECIAL-STATUS PLANTS, WILDLIFE, AND NATURAL COMMUNITIES

Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described below in Section 5.0, state and federal laws have provided the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A number of native plants and animals have been formally designated as threatened or endangered under state and federal endangered species legislation. Others have been designated as "candidates" for such listing. Still others have been designated as "species of special concern" by the CDFG. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened or endangered (CNPS 2001). Collectively, these plants and animals are referred to as "special-status species."

A list of special-status animal species that have been recorded in the vicinity of the project site was generated from a review of the California Natural Diversity Database (CDFG 2006) and the

California Native Plant Society Inventory of Rare and Endangered Vascular Plants of California (2001) and reports prepared for other projects in the vicinity. Species which have been recorded in the Brentwood, Antioch North, Antioch South, Tassajara, Byron Hot Springs, Clifton Court Forebay, Woodward Island, Bouldin Island, and Jersey Island topographic quads were considered for their potential to occur on site. From this list, species that have habitat requirements that are clearly not met on site (such as species which occur in salt marsh habitats) were excluded from the analysis. A final list was generated that includes those special-status plant and animal species that were assessed for their potential to occur in the project area (Appendices B and C). The potential for special-status plant and animal species to occur within the study area was assessed during and after the site reconnaissance.

A discussion of the potential for special-status species to occur on the project site is provided below, followed by recommendations on the need for further study and mitigation measures.

4.1 Special-status Plants

Thirty-three special-status plant species occurring in the vicinity of the study area were evaluated (Appendix B) for their potential to occur on site. The project site has been completely disturbed over many years of agricultural cultivation, and has been fallow for at least two years. As a result, it is largely occupied by ruderal, non-native vegetation where it has not been disked for fire control, and where the gas pumping station is located.

Focused botanical surveys of the Sand Creek Road alignment on the Sciortino property were conducted on April 21 and August 2, 2005 (Wood Biological, August 10, 2005, Appendix D). No special-status species were detected. Given the negative findings for the surveys conducted in 2005, the low botanical diversity detected during those surveys characteristic of a highly disturbed site, and the uniform conditions across the study area, we determined that the potential for special-status plant species to occur on site is negligible, and that further botanical surveys are not warranted.

4.2 Special-status Wildlife

Although the site is highly disturbed, the fallow fields, group of tall trees, and ground squirrel burrows provide suitable habitat for several special-status animals. Thirty-one special-status species known from the project area were evaluated to determine the presence of suitable habitat and potential to occur in the study area (Appendix C).

The ground squirrel burrows in the fallow fields of the project site provide suitable nesting habitat for the burrowing owl (*Athene cunicularia*), a California Species of Special Concern. One burrowing owl was observed during the September 27 site visit and two individuals were observed by Mosaic biologists on the property in February and March 2006 during surveys conducted for the Barrington project. Those owls did not nest on site, probably due to the height of the vegetation, which exceeded six feet during the spring and early summer. Burrowing owls are ground nesting birds that utilize ground squirrel burrows year round, with the nesting season occurring between February and August and peak nesting activity from mid-April to mid-July. Although burrowing owls have been observed on site, the height of ruderal vegetation across

most of the site probably limits the suitability of the site for nesting. Perimeter areas of the site where vegetation height has been controlled and ground squirrel burrows are present have a higher potential for burrowing owl nesting. Numerous ground squirrel burrows suitable for burrowing owls are present across the site.

Perimeter areas of the study area where vegetation is sparser provide marginal nesting habitat for the California horned lark (*Eremophila alpestris actia*), a California Species of Special Concern. The trees surrounding the old residential site at the southwest corner of the roadway alignment provide suitable nesting habitat for Swainson's hawk (*Buteo swainsoni*), state threatened, although the recent development of agricultural fields surrounding the site has substantially reduced foraging habitat for this species. Furthermore, no Swainson's hawks were observed during focused surveys conducted in 2006 for the Barrington project, which encompassed the Sciortino property (Mosaic Associates, April 27, 2006).

The on-site trees also provide marginal nesting habitat for the white-tailed kite (*Elanus leucurus*) a California Species of Special Concern and fully protected species, while the smaller trees and shrubs in this area provide suitable nesting habitat for loggerhead shrike (*Lanius ludovicianus*), a California Species of Special Concern. Two loggerhead shrikes were observed during our site visit.

The fallow field and trees in the study area also provide habitat for other ground and tree-nesting avian species protected by the Migratory Bird Treaty Act.

California tiger salamanders (*Ambystoma californiense*) have no potential to occur within the study area due to the intensive agricultural cultivation on the site and adjoining properties. A site assessment for California tiger salamanders prepared for the Barrington project (Jennings 2005) concluded that there was no potential for occurrence and the United States Fish and Wildlife Service concurred with that finding (USFWS 2005).

The remaining 25 species were excluded from further analysis as the site lacks habitat suitable for these species.

4.3 Special-status Natural Communities

Special-status natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (*i.e.*, §404 and 401 of the Clean Water Act, the CDFG §1600 *et seq.* of the California Fish and Game Code, and/or the Porter-Cologne Act). In addition, the CNDDB has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986, CDFG 2003e).

The excavated pit along the eastern perimeter of the site was probably constructed to receive agricultural tailwater when the site was under cultivation. There was no freshwater marsh vegetation in this feature, and based on observations made by Mosaic biologists during field surveys for the Barrington property, this pit does not pond water beyond periods of high precipitation. The pit is not connected to a surface waterway and does not qualify as waters of the state or U.S.

There are no special-status natural communities present on site.

5.0 RELEVANT POLICIES AND LAWS

A number of federal, state and local policies provide the regulatory framework that guides the protection of biological resources. The following discussion focuses on those laws and policies that are most relevant to the biological resources of the study area.

5.1 Threatened and Endangered Species

State and federal "endangered species" legislation has provided the CDFG and the USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Permits may be required from both the CDFG and USFWS if activities associated with a proposed project will result in the "take" of a listed species. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Game Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFG and the USFWS are responsible agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

5.2 Migratory Birds

State and federal laws also protect most bird species. The Migratory Bird Treaty Act (MBTA: 16 U.S.C., sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

5.3 Birds of Prey

Birds of prey are also protected in California under provisions of the State Fish and Game Code, Section 3503.5, (1992), which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG.

5.5 Local Policies

The City of Brentwood has identified certain policies relating to the protection of natural resources in its General Plan (1993). These policies include the reduction of solid waste, preservation of vegetation, and maintenance of waterways.

The following goals, policies, and programs are applicable to the proposed project.

Goal 7: Natural Resources – Protect the Brentwood Planning Area's natural resources.

> *Policy 7.2*: Preserve Vegetation – Preserve vegetation and associated wildlife habitat in the Brentwood Planning Area.

6.0 SIGNIFICANCE CRITERIA

The CEQA Guidelines identifies potentially significant environmental effects on biological resources, including:

1. A substantial adverse effect, either directly or through habitat modifications, on any special-status species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the CDFG or USFWS.

2. A substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

3. A substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

4. Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The proposed project would result in site disturbance and habitat conversion across the entire study area. Modifications of the locations of project improvements or, indeed, changes in the types of improvements would not require a reassessment of project impacts to biological resources. The only changes in site development that could alter the project's impacts to biological resources would be reductions in the scale or intensity of site development plans. Since a reduction in area developed and habitat converted would reduce the project's impact to biological resources, such alterations in project plans would not require a reassessment of the project's impacts to biological resources.

7.0 IMPACTS AND MITIGATION MEASURES

Potential impacts of the project and suggested mitigation measures are listed below. Potential impacts of the project would be rendered less-than-significant with implementation of the mitigation measures described below.

7.1 Impacts to Special-status Plants

Potential Impact. The project proposes to convert habitat across the site to developed uses. Thirty-three special-status plant species occurring in the region surrounding the project were assessed for their potential to occur on site. However, due to the highly disturbed nature of the site and absence of special-status species in focused botanical surveys of the Sand Creek Road alignment conducted in 2005, suitable habitat for these species is absent, and there is no potential for special-status plant species to occur within the project site. Therefore, no impacts to special-status plants are expected.

Mitigation Measure. None required.

7.2 Impacts to Burrowing Owl

Impact 1. A burrowing owl was present on site in September 2006, and two were observed in February and March 2006. Construction of the project has the potential to result in a "take" of burrowing owls if they are present on site at the time of construction, and would result in the loss of occupied burrowing owl habitat. This would be considered a significant impact. Impacts would be rendered less-than-significant with implementation of the following mitigation measures.

Mitigation Measure 1.1 Surveys for burrowing owls shall be conducted during the height of the nesting season, between April 15 and July 15 in accordance with the survey requirements detailed in the California Department of Fish andGame (CDFG) 1995 *Staff Report on Burrowing Owl* and the California Burrowing Owl Consortium's (CBOC) Survey Protocol (1997). The survey shall be conducted by a qualified biologist to determine the number of burrowing owls present during the nesting season. Completion of the nesting season surveys does not exempt the applicant from conduct of preconstruction surveys if site disturbance does not commence within 30 days of the nesting season surveys.

Mitigation Measure 1.2 If site disturbance commences during the nesting season (between February 1 and August 31) and burrowing owls are detected on or within 250-feet of the site, a fenced buffer shall be erected not less than 250-feet between the nest burrow(s) and construction activities. The 250-foot buffer shall be observed and the fence left intact until a qualified biologist determines that the young are foraging independently, the nest has failed, or the owls are no longer using any burrows within the buffer.

Mitigation Measure 1.3 To offset the loss of foraging and burrow habitat on the project site, a minimum of 6.5 acres of nesting and foraging habitat per pair or unpaired resident bird

must be acquired and permanently protected. Mitigation shall be consistent with the CDFG Staff Report (1995). Off-site mitigation can be provided at an approved conservation bank, or on other lands protected by a conservation easement and managed subject to a burrowing owl management plan prepared by a qualified burrowing owl biologist.

Mitigation Measure 1.4 Surveys performed consistent with the CBOC protocol shall be conducted not less than 30 days prior to site disturbance. If site disturbance commences outside of the nesting season, and burrowing owl(s) are present on site or within 160 feet of site disturbance, passive relocation consistent with the CDFG Staff Report (1995) and the CBOC Survey Protocol (1997) shall be performed. At least one or more weeks will be necessary to accomplish this and allow the owls to acclimate to alternate burrows The preconstruction surveys shall be repeated if more than 30 days elapse between the last survey and the start of construction activities.

7.2 Impacts to Swainson's Hawk

Impact 2. The trees on site provide suitable nesting habitat for Swainson's hawk, although the potential for this species to nest on site is low given the limited area of foraging habitat in the vicinity of the study area. Construction of the project has the potential to disrupt nesting behavior if occupied nests are present on or near the site. This would be considered a significant impact. Impacts would be rendered less-than-significant with implementation of the following mitigation measures.

Mitigation Measure 2.1. If construction is proposed by the developer during the nesting season (February-August), a pre-construction survey for active Swainson's hawk nests shall be conducted within a 0.5-mile radius of the study area by a qualified biologist in a manner consistent with the survey protocol developed by the Swainson's Hawk Technical Advisory Committee (May 31, 2000). If no active nests are found during the pre-construction survey, no further action is required. If active nests are found, the findings will be submitted to CDFG and a buffer zone of a minimum of one-quarter mile (approximately 1300 feet) shall be established around the active nest. Intensive new disturbances (e.g., heavy equipment activities associated with construction) that may cause nest abandonment or forced fledging shall not be initiated within this buffer zone between March 1 and September 1. Any trees containing nests that must be removed as a result of project implementation shall be removed during the non-breeding season (September to January).

Mitigation Measure 2.2. The developer shall be responsible for mitigating the loss of Swainson's hawk foraging habitat on the Sciortino study area if an active nest is detected within 0.5 mile of the site. The type and amount of mitigation, if necessary, shall be determined by the City with technical assistance from CDFG.

7.3 Impacts to Nesting Raptors and Other Migratory Birds

Impact 3. The trees and ruderal vegetation on site provide suitable nesting habitat for several special-status species including California horned lark, loggerhead shrike, white-tailed kite and other migratory birds. Construction of the project has the potential to cause the failure of

occupied nests. This would be considered a significant impact. Impacts would be rendered less-than-significant with implementation of the following mitigation measure.

Mitigation Measure 3. If site disturbance commences during the nesting season (February 1 – August 15), a preconstruction survey shall be conducted by a qualified wildlife biologist within 15 days of the start of project-related activities. If nests of migratory birds are detected on site or within 75 feet (for migratory passerine birds) or 250-feet (for birds of prey) of the site, the applicant shall observe no-disturbance buffers of 75 feet for migratory passerine and 250 feet for birds of preys until August 15, or the qualified biologist determines that the young are foraging independently, or the nest has been abandoned.

7.3 Impacts to Special-status Natural Communities

Potential Impact. No special-status natural communities are present on the project site and thus no impacts are anticipated.

Mitigation Measure. None required.

7.5 Interference with the Movement of Native Wildlife

Potential Impact. The site is not situated within an apparent "movement corridor" for native wildlife, although some species may move within and through it. Site development will have a negligible effect on home range and dispersal movements of native wildlife present in the site vicinity. Therefore, the project will result in a less-than-significant effect on the movements of native wildlife.

Mitigation. None required.

7.6 Conflict with Local Policies and Ordinances

Potential Impact. The City of Brentwood has adopted Goals and Policies regarding the protection of natural resources in the Brentwood Planning Area. The project proposes the conversion fallow farmland to residential and commercial development. While the ruderal vegetation on site does provide habitat for a number of animals, the proposed project does not conflict with local policies or ordinances adopted for the Brentwood Planning Area.

Mitigation. None required.

8.0 LITERATURE CITED

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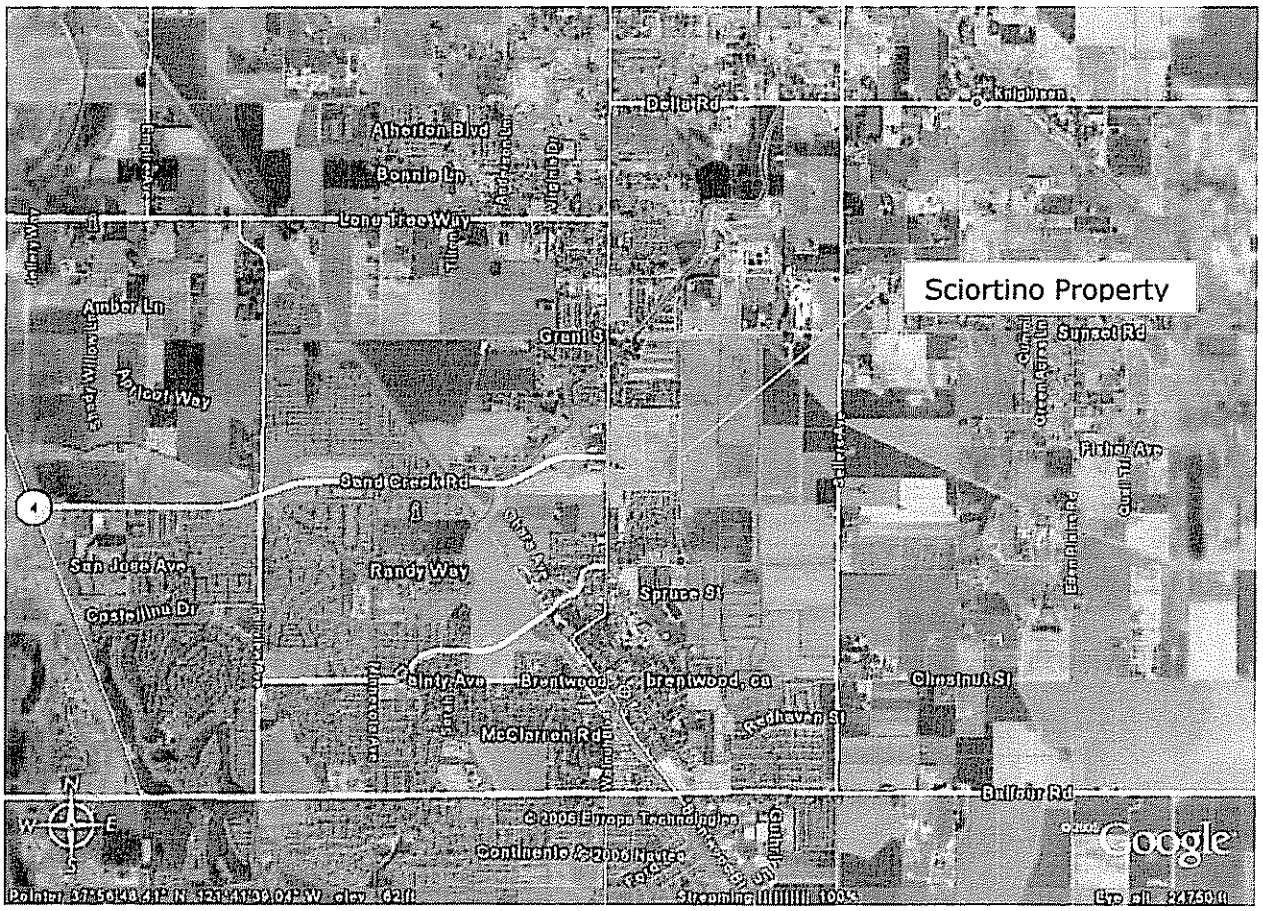
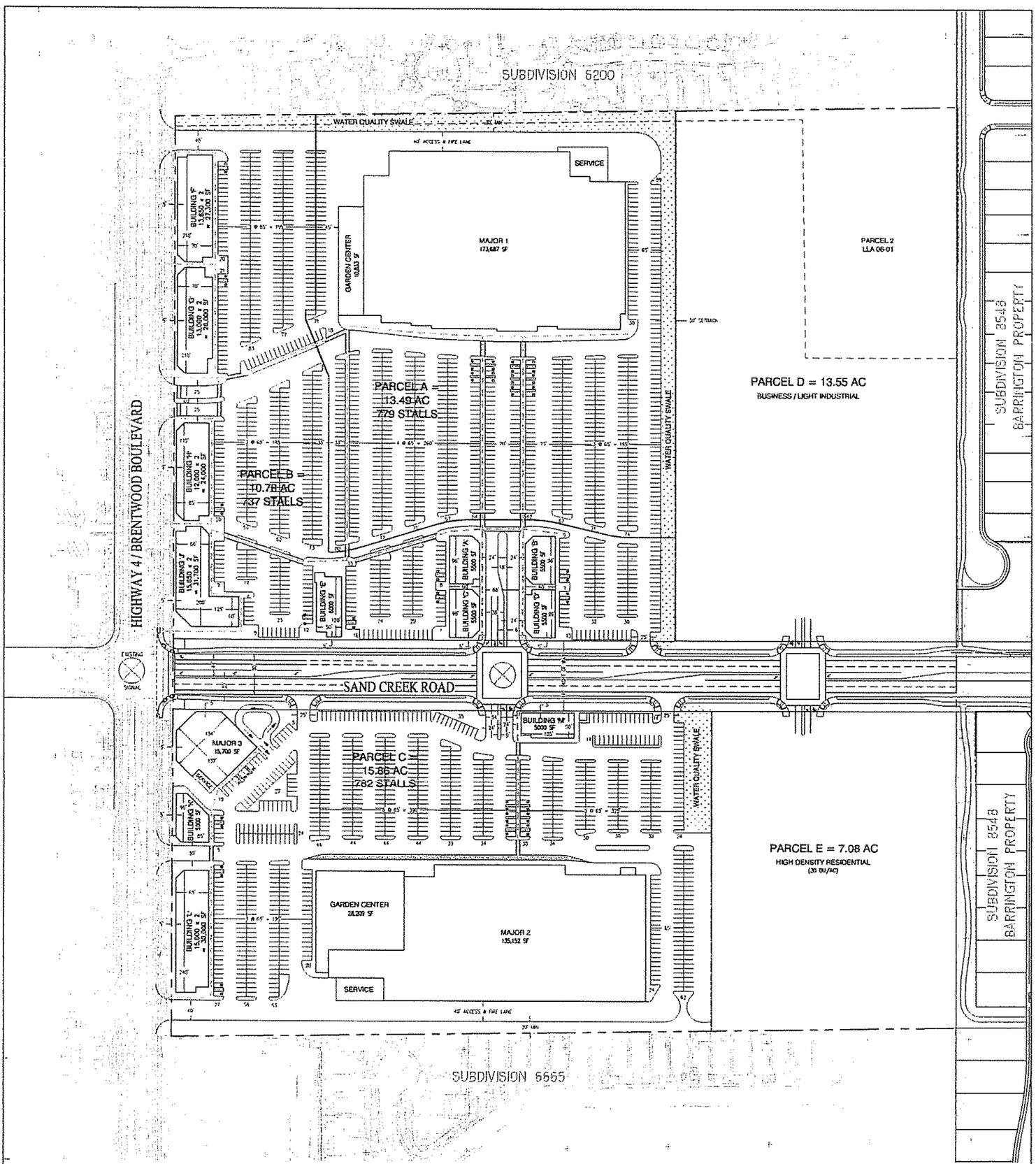
Figure 1.
Vicinity Map



Map courtesy Google Earth, downloaded 2006

Figure 2.
Conceptual Site Plan, Sciortino Property (Carlson, Barbee & Gibson, Inc. 2006)



BUSINESS/LIGHT INDUSTRIAL/RESIDENTIAL SITE PLAN SUMMARY

PARCEL	PARCEL AREA
PARCEL 'D'	13.55 AC
PARCEL 'E'	7.08 AC
TOTALS	20.63 AC

COMMERCIAL / RETAIL SITE PLAN SUMMARY

PARCEL	PARCEL AREA	BUILDING AREA (SF)	PARKING PROVIDED
PARCEL 'A'	13.49 AC	MAJOR 1 RETAIL = 173,687 SF GARDEN CTR = 10,833 SF	779 (4.2/1000 SF)
PARCEL 'B'	10.78 AC	BUILDINGS A, B, C, D, E, F, G, H & J RETAIL = 137,000 SF	737 (5.3/1000 SF)
PARCEL 'C'	15.86 AC	MAJOR 2 RETAIL = 135,152 SF GARDEN CTR = 28,209 SF	570 (3.5/1000 SF)
		MAJOR 3 & BUILDING K RETAIL = 20,700 SF	93 (4.5/1000 SF)
		BUILDING L RETAIL = 30,000 SF	114 (3.8/1000 SF)
		BUILDING M RETAIL = 5,000 SF	28 (5.6/1000 SF)
TOTALS	39.78 AC	540,581 SF	2,321 STALLS

LEGEND

IMPROVED SIGNALIZED INTERSECTION

EXISTING PROPERTY BOUNDARY
PROPOSED PARCEL BOUNDARY
PEDESTRIAN ROUTE ACCESS

DRAFT

CONCEPTUAL SITE PLAN
SCIORTINO PROPERTY

CITY OF BRENTWOOD CONTRA COSTA COUNTY, CA

0' 60' 180' 240'

SCALE: 1"= 60'
SEPTEMBER 22, 2006

cbg
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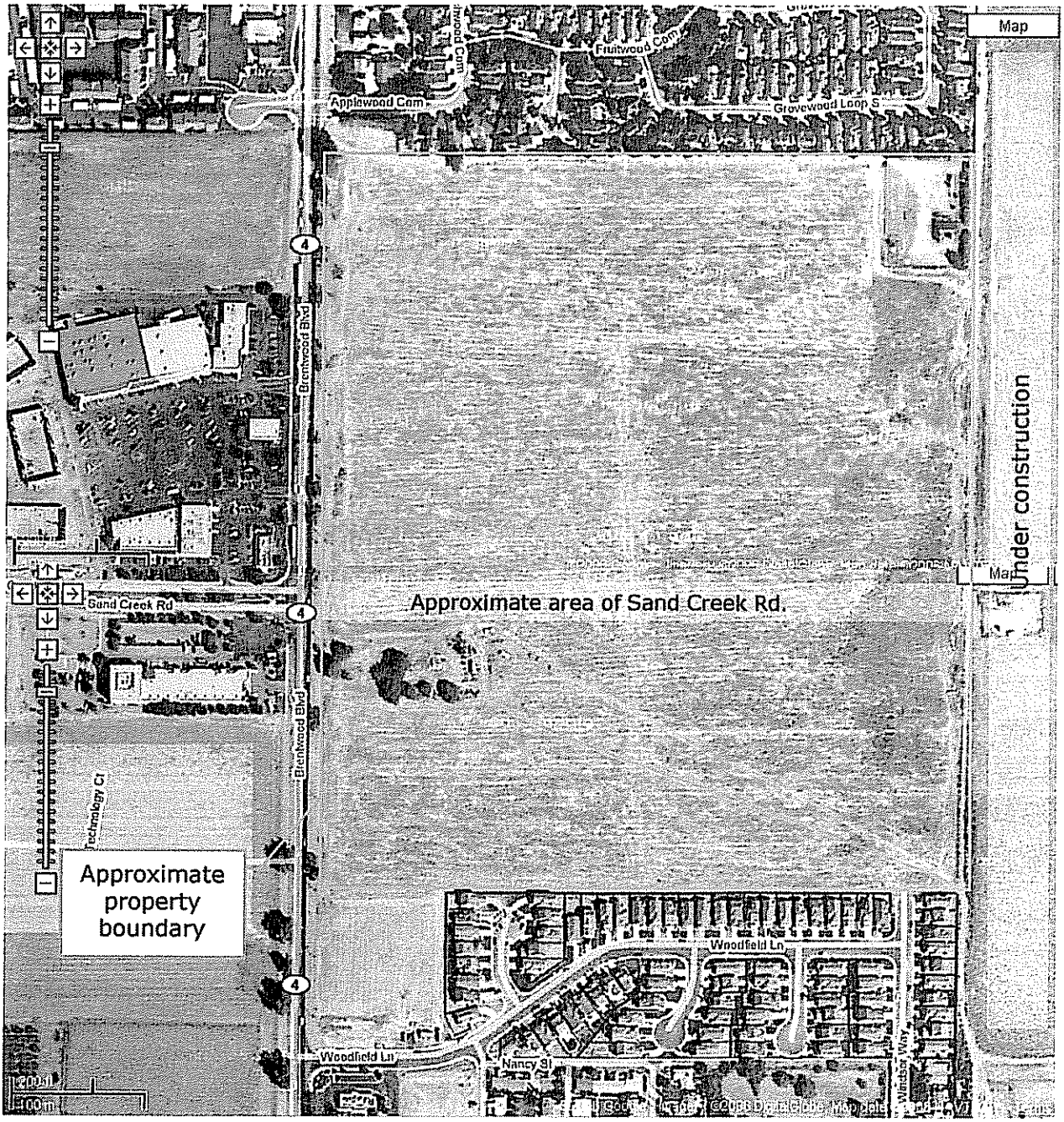
PRELIMINARY PLAN

DRAFT

Figure 3.
Aerial Photo of Sciortino Property



Map Courtesy GoogleMaps

APPENDIX A
REPRESENTATIVE PHOTOS OF THE SCIORTINO SITE

Photo 1. Looking west. The site is mostly occupied by ruderal habitat. Note the mosaic of non-native grasses and stands of thistle. Mt. Diablo is in the hazy background.

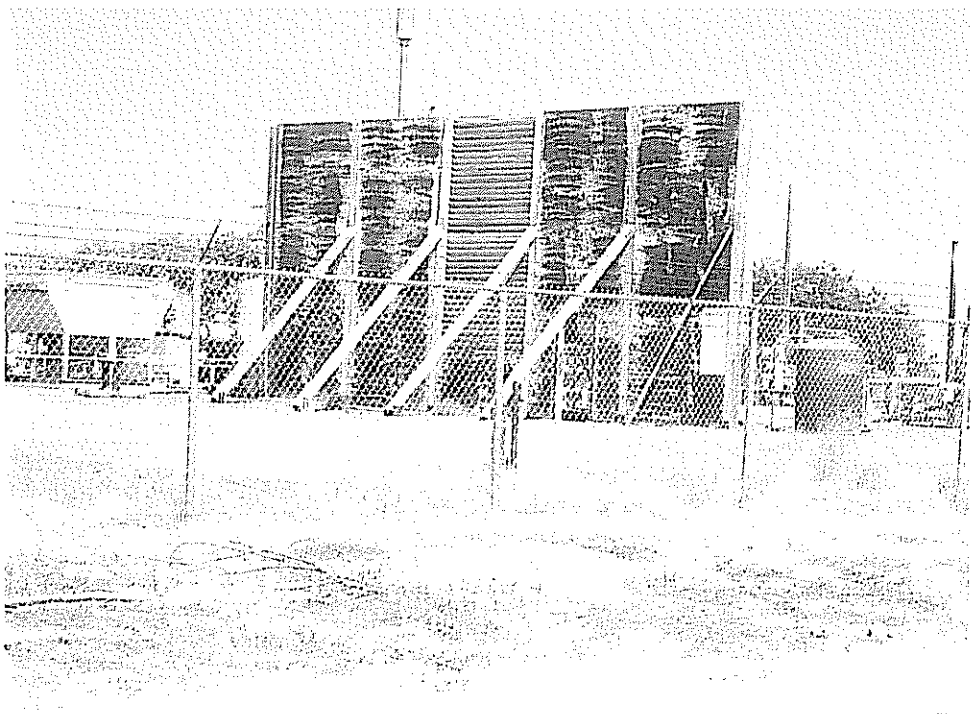


Photo 2. View of pump station located in the northeast corner of the property. A stand of oleander bushes is planted on the eastern perimeter of the pump station.

Photo 3. View of excavated pit located on eastern perimeter of property, south of the pump station. The bottom of the pit was recently cleared of debris. The culvert probably was used to convey agricultural runoff since there is no surface or apparent subsurface connection to any other waterway.

Photo 4. View, looking west, of grading for Sand Creek Road extension The trailers and trees in the back are located near the former home site.

APPENDIX B

POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES AT THE SCIORTINO SITE

Special-status plant species with potential to occur from the Sciortino Study Area vicinity. List compiled from searches of CalBiota (2004), the California Natural Diversity Database (September 2006) Contra Costa County, Brentwood, Antioch North, Antioch South, Tassajara, Byron Hot Springs, Clifton Court Forebay, Woodward Island, Bouldin Island, and Jersey Island 7.5' USGS topographic quadrangles, the California Native Plant Society Inventory of Rare and Endangered Plants of California, biotic assessments of surrounding properties and other literature.

Species	Common Name	Fed Status	State Status	CNPS Status	Typical Habitat	Potential for Occurrence in Study Area
Amsinckia grandiflora	large-flowered fiddleneck	FE, G1	CE, S1.1	1B	Cismontane woodland, valley and foothill grassland.	**None.** Not detected during 2005 survey.
Arctostaphylos auriculata	Mt. Diablo manzanita	G2	S2.2	1B	Chaparral.	**None.** No suitable habitat present.
Arctostaphylos manzanita ssp. laevigata	Contra Costa manzanita	G5T2	S2	1B	Chaparral.	**None.** No suitable habitat present.
Aster lentus	Suisun Marsh aster	G2	S2.2	1B	Marshes and swamps (brackish and freshwater).	**None.** No suitable habitat present.
Astragalus tener var. tener	alkali milk-vetch	G1T1	S1.1	1B	Alkali playa, valley and foothill grassland, vernal pools.	**None.** No suitable habitat present.
Atriplex depressa	brittlescale	G2Q	S2.2	1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools.	**None.** No suitable habitat present.
Atriplex joaquiniana	San Joaquin spearscale	G2	S2.1	1B	Chenopod scrub, alkali meadow, valley and foothill grassland.	**None.** No suitable habitat present.
Blepharizonia plumosa	big tarplant	G1	S1.1	1B	Valley and foothill grassland.	**None.** Not detected during 2005 survey.
Calochortus pulchellus	Mt. Diablo fairy-lantern	G2	S2.1	1B	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland.	**None.** No suitable habitat present.
Carex comosa	bristly sedge	G5	S2?	2	Marshes and swamps.	**None.** No suitable habitat present.
Centromadia parryi ssp. congdonii	Congdon's tarplant	G4T3	S3.2	1B	Valley and foothill grassland.	**None.** Not detected during 2005 survey.
Cryptantha hooveri	Hoover's cryptantha	GH	SH	1A	Valley and foothill grassland.	**None.** No suitable habitat present.
Delphinium recurvatum	recurved larkspur	G2	S2.2	1B	Chenopod scrub, valley and foothill grassland, cismontane woodland.	**None.** No suitable habitat present.

Species	Common Name	Fed Status	State Status	CNPS Status	Typical Habitat	Potential for Occurrence in Study Area
Eriogonum truncatum	Mt. Diablo buckwheat	G1	S1.1	1B	Chaparral, coastal scrub, valley and foothill grassland.	**None.** No suitable habitat present.
Erodium macrophyllum	Round-leaved filaree	None	None	2	Cismontane woodland, foothill woodland, valley and foothill grassland.	**None.** Not detected during 2005 survey.
Eryngium racemosum	Delta button-celery	G2Q	CE, S2.1	1B	Riparian scrub.	**None.** No suitable habitat present.
Erysimum capitatum ssp. angustatum	Contra Costa wallflower	FE, G5T1	CE, S1.1	1B	Inland dunes.	**None.** No suitable habitat present.
Eschscholzia rhombipetala	diamond-petaled California poppy	G1	S1.1	1B	Valley and foothill grassland.	**None.** Not detected during 2005 survey.
Helianthella castanea	Diablo helianthella	G3	S3.2	1B	Broadleaved upland forest, chaparral, cismontane wdlnd, coastal scrub, riparian woodland, valley & foothill grassland.	**None.** Not detected during 2005 survey.
Hesperolinon breweri	Brewer's western flax	G2	S2.2	1B	Chaparral, cismontane woodland, valley and foothill grassland.	**None.** No suitable habitat present.
Hibiscus lasiocarpus	rose-mallow	G4	S2.2	2	Marshes and swamps (freshwater).	**None.** No suitable habitat present.
Lasthenia conjugens	Contra Costa goldfields	FE, G1	S1.1	1B	Valley and foothill grassland, vernal pools, cismontane woodland. Extirpated from most of its range; extrem. Endangered.	**None.** No suitable habitat present
Lathyrus jepsonii var. jepsonii	Delta tule pea	G5T2	S2.2	1B	Freshwater and brackish marshes.	**None.** No suitable habitat present.
Lilaeopsis masonii	Mason's lilaeopsis	G3	S3.1	1B	Freshwater and brackish marshes, riparian scrub.	**None.** No suitable habitat present.
Limosella subulata	Delta mudwort	G4?Q	S2.1	2	Riparian scrub, freshwater marsh, brackish marsh. Probably the rarest of the suite of delta rare plants.	**None.** No suitable habitat present.
Madia radiata	showy madia	G2	S2.1	1B	Valley and foothill grassland, cismontane woodland, chenopod scrub.	**None.** Not detected during 2005 survey.
Oenothera deltoides ssp. howellii	Antioch Dunes evening-primrose	FE, G5T1	CE, S1.1	1B	Interior dunes.	**None.** No suitable habitat present.
Potamogeton zosteriformis	eel-grass pondweed	G5	S2.2?	2	Marshes and swamps.	**None.** No suitable habitat present.
Scutellaria galericulata	marsh skullcap	G5	S2.2?	2	Marshes and swamps, lower montane coniferous forest, meadows and seeps.	**None.** No suitable habitat present.
Scutellaria lateriflora	blue skullcap	G5	S1.2	2	Meadows and seeps, marshes and swamps.	**None.** No suitable habitat present.
Senecio aphanactis	rayless ragwort	G3?	S1.2	2	Cismontane woodland, coastal scrub.	**None.** No suitable habitat present.
Symphyotrichum lentum	Suisun Marsh aster	FSC	None	1B	Freshwater marsh, marshes and swamps.	**None.** No suitable habitat present.
Tropidocarpum capparideum	caper-fruited tropidocarpum	G1	S1.1	1B	Valley and foothill grassland.	**None.** Not detected during 2005 survey.

Key to Status:	
FSC	Federal Species of Concern
FE	Federal Endangered
FT	Federal Threatened
CE	California Endangered
CT	California Threatened
CR	California Rare
CSC	California Department of Fish and Game Species of Special Concern
List 1A	CNPS list of plants that are presumed extinct in California
List 1B	CNPS list of plants rare, threatened, or endangered in California and elsewhere
List 2	CNPS list of plants rare, threatened, or endangered in California but more common elsewhere
List 3	CNPS list of plants which need more information; a review list
List 4	CNPS list of plants of limited distribution; a watch list
G1	Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2	6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3	21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4	Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5	Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
T-rank	Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety.
S1	Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres S1.1 = very threatened S1.2 = threatened S1.3 = no current threats known
S2	6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres S2.1 = very threatened S2.2 = threatened S2.3 = no current threats known
S3	21-80 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres S3.1 = very threatened S3.2 = threatened S3.3 = no current threats known
S4	Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.
S5	Demonstrably secure to ineradicable in California. NO THREAT RANK.
DFG Special Plant	California Department of Fish and Game special species list.

APPENDIX C
POTENTIALLY OCCURRING SPECIAL-STATUS ANIMAL SPECIES AT THE SCIORTINO SITE

Special-status wildlife species with potential to occur in the Sciortino Study Area vicinity. List compiled from searches of CalBiota (2004); the California Natural Diversity Database (September 2006) Contra Costa County, Brentwood, Antioch North, Antioch South, Tassajara, Byron Hot Springs, Clifton Court Forebay, Woodward Island, Bouldin Island, and Jersey Island 7.5' USGS topographic quadrangles; biotic assessments of surrounding properties and other literature.

Species	Status	Typical Habitat	Potential for Occurrence in Study Area
Branchiopods			
Longhorn fairy shrimp *Branchinecta longiantenna*	FE DFG: Special Animal	Inhabits small, clear-water depressions in sandstone and clear-to-turbid clay/grass-bottomed pools in shallow swales.	**None.** No suitable habitat present.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT DFG: Special Animal	Inhabits small, clear-water depressions in sandstone, astatic rain-filled pools and grassed swales, earth slumps, or basalt-flow depression pools.	**None.** No suitable habitat present.
Midvalley fairy shrimp *Branchinecta mesovallensis*	DFG: Special Animal	Inhabits vernal pools.	**None.** No suitable habitat present.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE DFG: Special Animal	Inhabits vernal pools and grassy swales of unplowed grasslands. Tolerant of mud-bottoms and highly turbid conditions.	**None.** No suitable habitat present.
Gastropods			
Bridges' shoulderband snail *Helminthoglypta nickliniana bridgesi*	DFG: Special Animal	Tends to colonize under tall grasses and weeds. Prefers rock piles. Inhabits open hillsides. Recorded from Kensington and in the vicinity of Thousand Oaks in the Berkeley Hills and in San Pablo Creek.	**None.** No suitable habitat present.
Insects and Arthropods			
Andrena blennospermatis	G2, S2	A bee that pollinates only one or a few vernal pool plant species.	**None.** No suitable habitat present.

Species	Status	Typical Habitat	Potential for Occurrence in Study Area
Lange's metalmark butterfly *Apodemia mormo lagei*	FE	Inhabits stabilized dunes along San Joaquin River. Endemic to Antioch Dunes, Contra Costa County.	**None.** No suitable habitat present.
San Joaquin dune beetle *Coelus gracilis*	G1S1	Inhabits fossil dunes along western edge of San Joaquin Valley on sandy substrates.	**None.** No suitable habitat present.
Antioch efferian robberfly *Efferia antiochi*	S1S3	Known only from Fresno and Contra Costa Counties. Found in Antioch Dunes.	**None.** No suitable habitat present.
Redheaded sphecid wasp *Euerceris ruficeps*	G1S1	Nest in hard-packed sand in abandoned bee burrows	**None.** No suitable habitat present.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Found in riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant.	**None.** No suitable habitat present.
Reptiles and Amphibians			
California red-legged frog *Rana aurora draytonii*	FT, CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	**None.** No suitable habitat present.
Western pond turtle *Actinomys marmorata*	CSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg laying.	**None.** No suitable habitat present.
California horned lizard *Phrynosoma coronatum frontale*	CSC	Inhabits open, sandy areas in grasslands and washes.	**None.** No suitable habitat present.
Silvery legless lizard *Anniella pulchra pulchra*	CSC	Inhabits sandy or loose loamy soils under sparse vegetation.	**None.** No suitable habitat present
San Joaquin whipsnake *Masticophis flagellum ruddocki*	CSC	Inhabits open, dry habitats with little or no tree cover. Found in valley grassland and saltbrush scrub. Needs mammal burrows for refuge and oviposition sites.	**None.** No suitable habitat present

Species	Status	Typical Habitat	Potential for Occurrence in Study Area
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT, ST	Closely associated with chaparral and rock outcrops.	**None.** No suitable habitat present.
California tiger salamander *Ambystoma californiense*	FT, CSC	Breeds in vernal pools and temporary ponds, aestivates in burrows in grasslands	**None.** No suitable habitat present.
Giant garter snake *Thamnophis gigas*	FT	Inhabits wetlands and waterways including irrigation and drainage canals, slough, sponds, small lakes, low gradient streams, and adjacent uplands.	**None.** No suitable habitat present.
Birds			
Tricolored blackbird *Agelaius tricolor*	CSC	Open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of nesting colony.	**None.** No suitable habitat present.
Golden eagle (nesting and wintering) *Aquila chrysaetos*	CSC	Rolling foothills, mountain areas, sage-juniper flats, desert. Cliff-walled canyons and large trees in open areas provide nesting habitat.	**None.** No suitable habitat present.
Burrowing owl *Athene cunicularia*	CSC	Open, dry, annual or perennial grasslands, deserts, and scrublands characterized by low growing vegetation. Subterranean nester, dependent upon burrowing mammals.	**Present.** Observed in study area. Suitable nesting and foraging habitat is present.
Swainson's hawk (nesting) *Buteo swainsoni*	ST, FSC	Nests in isolated trees or in small groves surrounded by agricultural land or grasslands	**Low.** Marginal nesting habitat is present in the trees on site.
Northern Harrier *Circus cyaneus*	CSC	Coastal marsh and freshwater marsh, grassland. Nests on ground near marsh edge	**None.** No nesting habitat present on site.
California horned lark *Eremophila alpestris actia*	CSC	Occurs in open grasslands with low sparse vegetation	**Low.** Marginal habitat present.
Loggerhead shrike *Lanius ludovicianus*	CSC	Nests and forages in isolated small trees and shrubs in open grasslands.	**Present.** Observed foraging in Study Area. Suitable nesting habitat is present in the scattered trees and shrubs on site.

Species	Status	Typical Habitat	Potential for Occurrence in Study Area
White-tailed kite (nesting) *Elanus leucurus*	FSC	Open grasslands, meadows, or marshes for foraging, close to isolated, dense-topped trees for nesting and perching.	**Low.** Marginal nesting habitat is present in the trees on site.
Cooper's hawk (nesting) *Accipiter cooperi*	CSC	Deciduous, coniferous, and mixed woodlands, typically near open areas; open woodlands; wooded edges of rivers; occasionally, urban areas.	**None.** No nesting habitat present on site.
Mammals			
American badger *Taxidea taxus*	CSC	Drier, open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need adequate food source, and open, uncultivated ground.	**None.** No suitable habitat present.
San Joaquin kit fox *Vulpes macrotis mutica*	FE ST	Range includes annual grassland, saltbush scrub and oak savanna at the valley/mountain interface.	**None.** No suitable habitat present.
San Joaquin pocket mouse *Perognathus inornatus inornatus*	DFG : Special Animal	Inhabits grassland and scrub habitats in Central and San Joaquin Valleys.	**None.** No suitable habitat present.

Key to Status:

FSC	Federal Species of Concern
FE	Federal Endangered
FT	Federal Threatened
FWS	Fish and Wildlife Service: Migratory Nongame Birds of Management Concern
SE	State Endangered
ST	State Threatened
SR	State Rare
CSC	California Department of Fish and Game Species of Special Concern
CP	California Protected
DFG	California Department of Fish and Game

APPENDIX D
BOTANICAL SURVEYS, SAND CREEK ROAD EXTENSION, BRENTWOOD, CONTRA COSTA COUNTY

BY
WOOD BIOLOGICAL CONSULTING
AUGUST 10, 2005

Wood Biological Consulting
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August 10, 2005

Judy Bendix
Mosaic Associates, LLC
2310 San Pablo Avenue
Pinole, CA 94564

RE: Botanical Surveys, Sand Creek Road Extension, Brentwood, Contra Costa County

Dear Judy:

This report presents the results of a two-season focused botanical survey of the proposed Sand Creek Road extension in the City of Brentwood, Contra Costa County. The completion of these surveys is intended to satisfy the conditions of the California Environmental Quality Act (CEQA).

METHODS AND LIMITATIONS

Focused surveys were conducted by botanist Michael Wood of Wood Biological Consulting on April 21 and August 2, 2005. The timing of surveys was coordinated with local weather conditions and blooming cycles.

The study area encompasses approximately 3.3 acres, comprised of an 80 foot-wide corridor extending approximately 1,800 feet due east of Highway 4, opposite the eastern end of the existing Sand Creek Road. Survey methodology included walking meandering transects providing 100 percent visual coverage of the site. During the surveys, all distinct plant communities were visited and all plant species detected were identified and recorded. Prior to the April survey, the fallow agricultural lands making up the study area had not been disked or cultivated. Prior to the August survey, the entire site and surrounding fallow agricultural lands had been disked for weed and fire abatement. Despite this disturbance, sufficient plant remains were identifiable to afford a high level of confidence in the results summarized below.

Botanical survey guidelines outlined in the California Department of Fish and Game's *Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities* (CDFG 2000), the U.S. Fish and Wildlife Service's *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 2000), and California Native Plant Society (CNPS 2001) specify that surveys for special-status plant species must be performed during each season when all target species would be recognizable.

Information on special-status plant species was compiled through review of the California Natural Diversity Data Base (CNDDB 2004) and California Native Plant Society's *Inventory of Rare and Endangered Plants* (CNPS 2003), which is sanctioned by the CDFG and serves essentially as their list of "candidate" plant species. Also reviewed was *Special Vascular Plants, Bryophytes and Lichens List* (CDFG 2005a), *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (CDFG 2005b), the U.S. Fish and Wildlife Service's *Endangered and Threatened Wildlife and Plants* (USFWS 1999), *Endangered and Threatened Plant and Animal Taxa; Proposed Rule* (USFWS 1996), and *Threatened and Endangered Speeies System (TESS) Candidate Species as of 4/15/2005* (USFWS 2005). Information regarding species of local and regional significance was obtained by review of *Status of Rare, Threatened and Endangered Vascular Plants in Alameda and Contra Costa Counties (and Some Adjacent Areas)* (Olson 1994) and *Rare, Unusual and Significant Plants of Alameda and Contra Costa Counties* (Lake 2004).

Nomenclature used throughout this report conforms to Hickman (1993) for plants. Nomenclature for special-status plant species conforms to CDFG (2005a), except as updated following the Jepson Online Interchange (http://ucjeps.berkeley.edu/ interchange.html).

Based on a review of CNDDB (2004) and CNPS (2003), a total of 26 special-status plant species were considered to have some potential for occurrence in the project vicinity. A complete summary of these species, their habitat affinities and their potential to occur at the project site is provided in Appendix A. An explanation of sensitivity status codes is provided in Appendix B. A complete inventory of all vascular plant species detected during the present surveys is provided in Appendix C.

SETTING AND SITE DESCRIPTION

The study area is situated in a formerly rural but rapidly suburbanizing area of Brentwood, in eastern Contra Costa County (Figure 1). The study area and surrounding lands have been subject to intense, historic cultivation of row crops. The study area has not been actively cultivated for at least one year and was found to support a dense cover of non-native herbs typically associated with fallow agricultural lands in the region. No evidence of remnant native vegetation is present. The only woody vegetation present on site consists of volunteer saplings of Siberian elm (*Ulmus pumila*). An aerial photograph showing the study area and surrounding land uses as of 1993 is provided (Figure 2).

Vegetation

The dominant plant community occurring on site is ruderal in nature, having colonized a now fallow cultivated field.

Ruderal habitat is that from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. Such areas, if left undeveloped, typically become recolonized by invasive exotic species. Scattered native species may persist or may recolonize the site after disturbance has ceased.. Ruderal sites are typically dominated by herbaceous species, although scattered woody shrubs and trees may also begin to appear if left undisturbed long enough. Ruderal sites are characteristic of road sides, fallow agricultural fields, and vacant lots.

The entire study area was found to be densely covered by weedy herbaceous species. The dominant non-native species characteristic of ruderal sites present include Italian ryegrass (*Lolium multiflorum*), ripgut brome (*Bromus diandrus*), wild oats (*Avena fatua*), milk thistle (*Silybum marianum*), Italian thistle (*Carduus pycnocephalus*), charlock (*Sinapis arvensis*), and foxtail barley (*Hordeum murinum*). The only native species detected were scattered individuals of common fiddleneck (*Amsinckia menziesii* var. *menziesii*) and miner's lettuce (*Claytonia perfoliata*)

Ruderal habitat is not specifically described by Sawyer and Keeler-Wolf (1995) and would be classified as upland following Cowardin, *et al.* (1979).

RESULTS AND CONCLUSIONS

No state- or federally listed rare, threatened or endangered plant species were detected on site and none is considered to have any potential to occur there. Similar, no plant species otherwise considered by the CDFG as having special status were detected and none is considered to have any potential to occur there. In addition, no species considered a locally or regionally significant were detected.

The proposed development of the subject property would not result in any significant adverse effects upon special-status plant species. No further surveys or mitigation measures relevant to plant species are warranted. The performance of these surveys satisfies CEQA guidelines.

Sincerely,

Michael Wood

Enclosures: Literature Cited
Figure 1 – Project Location Map
Figure 2 – Aerial Photograph of Project Site
Appendix A - List of Potentially Occurring Special-Status Plants
Appendix B – Explanation of Sensitivity Status Codes
Appendix C - Plant Species Inventory

Literature Cited

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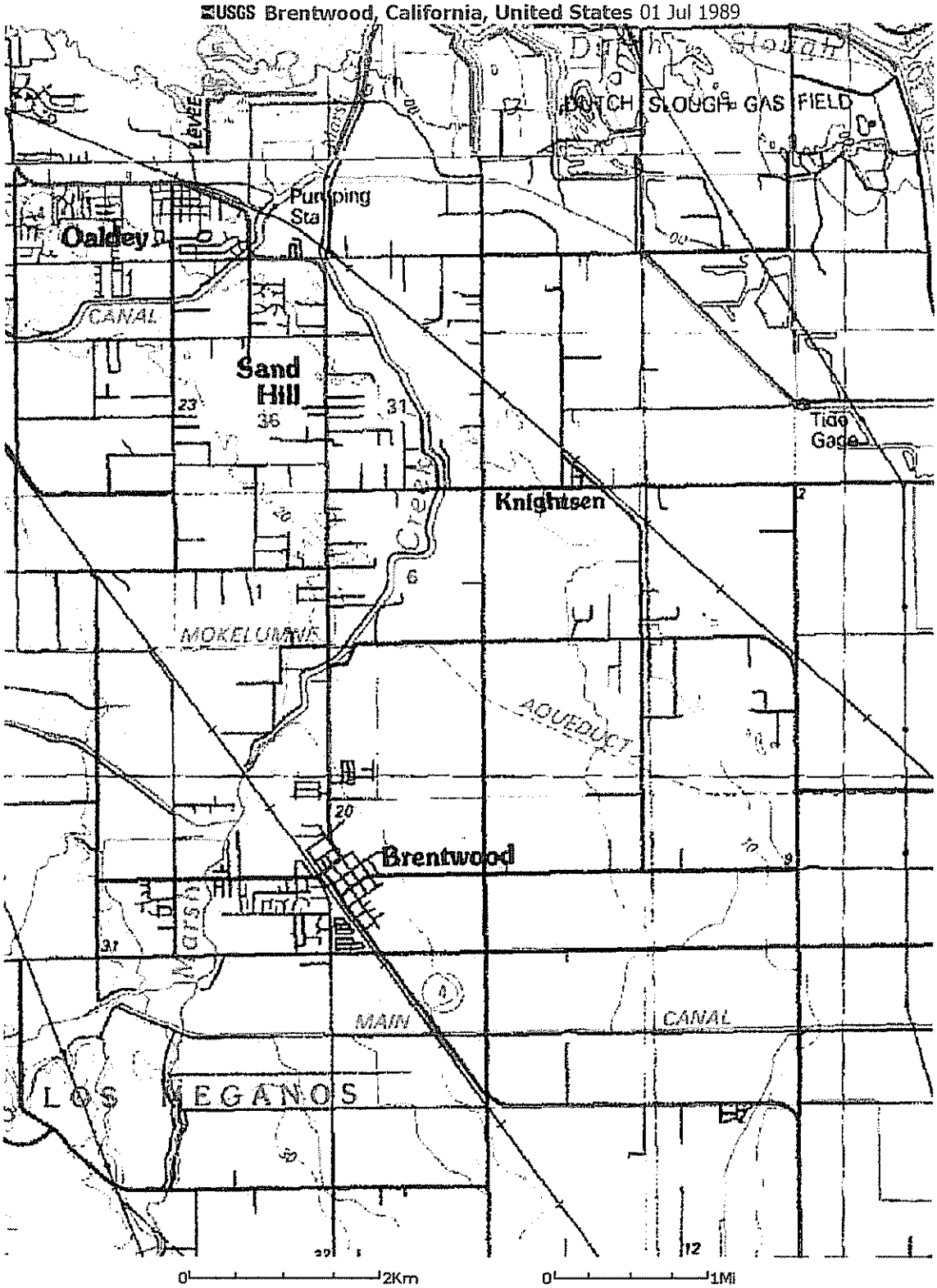
USGS Brentwood, California, United States 01 Jul 1989



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USGS **Brentwood, California, United States** 16 June 1993

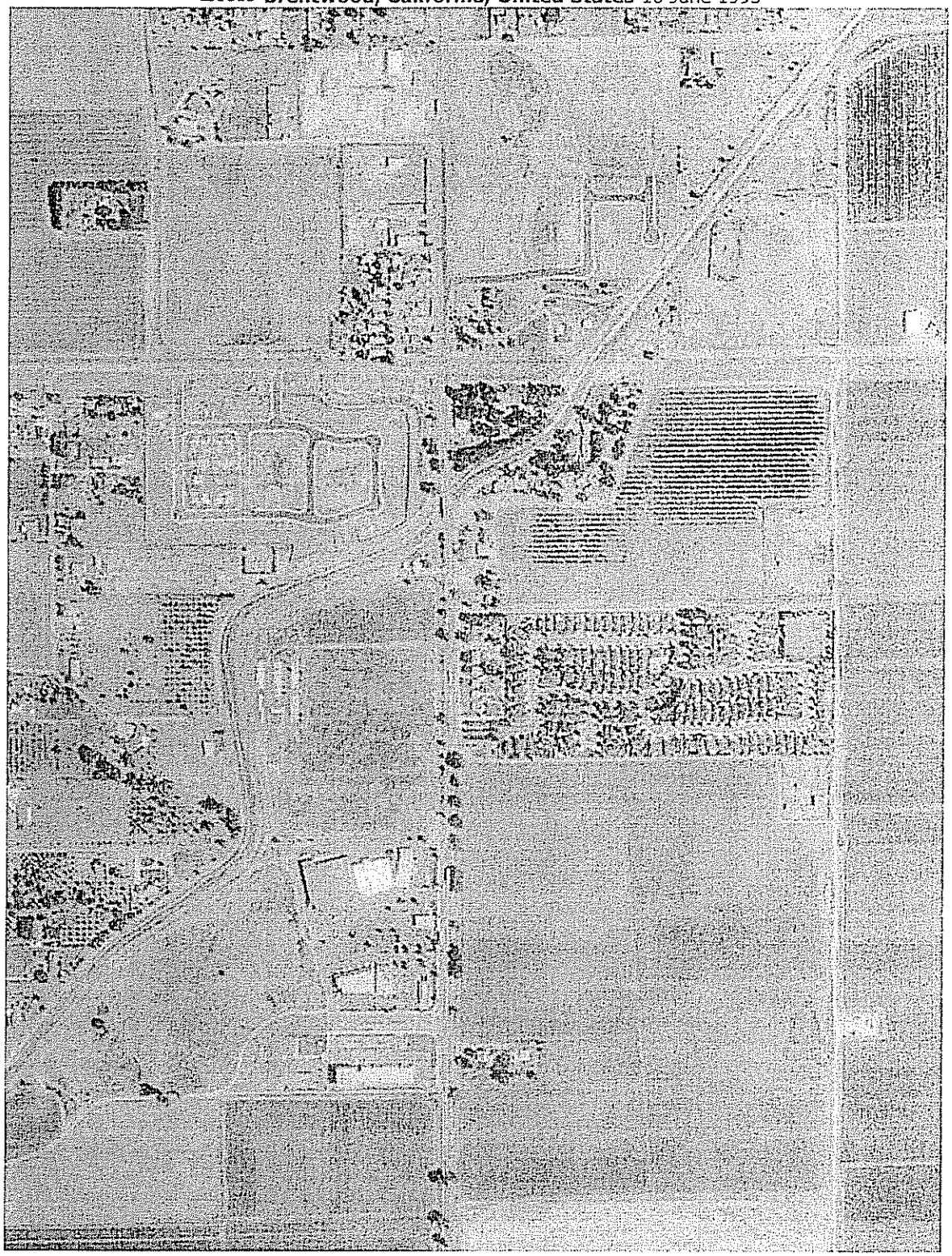

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Image courtesy of the U.S. Geological Survey

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Appendix A

List of Potentially Occurring Special-Status Plants

Potentially Occurring Special-status Plant Species Evaluated For The Sand Creek Road Extension Project

FAMILY *Scientific Name* Common Name	Status		Habitat Affinities And Reported Distribution	Blooming Time Life Form	Potential For Occurrence On Site
Apiaceae - Carrot Family					
Eryngium racemosum Delta button-celery	Federal State CNPS Other	(FSC) SE 1B 2-3-3 DFG: Special Plant	Occurs in riparian scrub vernally-moist, clay, Habitats Note: depressions. Recorded from Contra Costa, Merced, San Joaquin, Stanislaus.	Jun-Sep Annual/perennial Herb	None: no suitable habitat present.
Lilaeopsis masonii Mason's lilaeopsis	Federal State CNPS Other	(FSC) SR 1B 2-3-3 DFG: Special Plant	Occurs in freshwater marsh, marshes and swamps, riparian scrub. Recorded from Alameda, Contra Costa, Napa, Sacramento, San Joaquin, Solano.	Apr-Nov Perennial Herb (rhizomatous)	None: no suitable habitat present.
Asteraceae - Sunflower Family					
Blepharizonia plumosa big tarplant	Federal State CNPS Other	(FSC) none 1B 3-3-3 DFG: Special Plant	Occurs in valley and foothill grassland. Recorded from Alameda, Contra Costa, San Joaquin, Solano, Stanislaus.	Jul-Oct Annual Herb	None: marginally suitable habitat present. Would have been detectable.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	Federal State CNPS Other	(FSC) none 1B 3-3-3 DFG: Special Plant	Occurs in valley and foothill grassland. Recorded from Alameda, Contra Costa, Monterey, San Luis Obispo, Santa Clara, Santa Cruz, Solano.	Jun-Nov Annual Herb	None: marginally suitable habitat present. Would have been detectable

Potentially Occurring Special-status Plant Species Evaluated For The Sand Creek Road Extension Project

FAMILY *Scientific Name* Common Name	Status		Habitat Affinities And Reported Distribution	Blooming Time Life Form	Potential For Occurrence On Site
Helianthella castanea Diablo helianthella	Federal State CNPS Other	(FSC) none 1B 2-2-3 DFG: Special Plant	Occurs in broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, foothill woodland, northern coastal scrub, riparian woodland, valley and foothill grassland. Recorded from Alameda, Contra Costa, Marin, San Francisco, San Mateo.	Apr-Jun Perennial Herb	None: no suitable habitat present.
Lasthenia conjugens Contra Costa goldfields	Federal State CNPS Other	FE none 1B 3-3-3 DFG: Special Plant	Occurs in cismontane woodland, playas, valley and foothill grassland, vernal pools Moisture: moist. Recorded from Alameda, Contra Costa, Mendocino, Monterey, Napa, Santa Barbara, Santa Clara, Solano.	Mar-Jun Annual Herb	None: no suitable habitat present.
Madia radiata showy madia	Federal State CNPS Other	(FSC) none 1B 2-3-3 DFG: Special Plant	Occurs in cismontane woodland, foothill woodland, valley and foothill grassland. Recorded from Contra Costa, Fresno, Kern, Kings, Monterey, San Benito, San Joaquin, San Luis Obispo, Santa Barbara.	Mar-May Annual Herb	None: marginally suitable habitat present. Would have been detectable.
Senecio aphanactis rayless ragwort	Federal State CNPS Other	none none 2 3-2-1 DFG: Special Plant	Occurs in cismontane woodland, coastal sage scrub, coastal scrub, foothill woodland, northern coastal scrub Substrate: alkaline, Habitats Note: alkaline. Recorded from Alameda, Contra Costa, Fresno, Los Angeles, Merced, Orange, Riverside, San Diego, San Luis Obispo, Santa Barbara, Santa Clara, Solano, Ventura.Santa Catalina Island, Santa Cruz Island, Santa Rosa Island.Also recorded from Baja California.	Jan-Apr Annual Herb	None: no suitable habitat present.

Potentially Occurring Special-status Plant Species Evaluated For The Sand Creek Road Extension Project

FAMILY *Scientific Name* Common Name	Status		Habitat Affinities And Reported Distribution	Blooming Time Life Form	Potential For Occurrence On Site
Symphyotrichum lentum Suisun Marsh aster	Federal State CNPS Other	(FSC) none 1B 2-2-3 DFG: Special Plant	Occurs in freshwater marsh, marshes and swamps. Recorded from Contra Costa, Napa, Sacramento, San Joaquin, Solano.	May-Nov Perennial Herb (rhizomatous)	None: no suitable habitat present.
Boraginaceae - Borage Family					
Amsinckia grandiflora large-flowered fiddleneck	Federal State CNPS Other	FE SE 1B 3-3-3 DFG: Special Plant	Occurs in cismontane woodland, foothill woodland, valley and foothill grassland. Recorded from Alameda, Contra Costa, San Joaquin.	Apr-May Annual Herb	None: marginally suitable habitat present. Would have been detectable.
Cryptantha hooveri Hoover's cryptantha	Federal State CNPS Other	(FSC) none 1B 2-2-3 DFG: Special Plant	Occurs in valley and foothill grassland Habitats Note: sandy. Recorded from Alameda, Contra Costa, Madera, Merced, San Joaquin, Stanislaus.	Apr-May Annual Herb	None: no suitable habitat present.
Brassicaceae - Mustard Family					
Tropidocarpum capparideum caper-fruited tropidocarpum	Federal State CNPS Other	(FSC) none 1B 3-3-3 DFG: Special Plant	Occurs in valley and foothill grassland Substrate: alkaline. Recorded from Alameda, Contra Costa, Glenn, Monterey, San Joaquin, Santa Clara.	Mar-Apr Annual Herb	None: marginally suitable Would have been detectable.

Potentially Occurring Special-status Plant Species Evaluated For The Sand Creek Road Extension Project

FAMILY *Scientific Name* Common Name	Status	Habitat Affinities And Reported Distribution	Blooming Time Life Form	Potential For Occurrence On Site
Chenopodiaceae - Goosefoot Family				
Atriplex depressa brittlescale	Federal (FSC) State none CNPS 1B 2-2-3 Other DFG: Special Plant	Occurs in alkali sink, chenopod scrub, meadows, playas, shadscale scrub, valley and foothill grassland, vernal pools Substrate: clay, alkaline. Recorded from Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Madera, Merced, Solano, Stanislaus, Tulare, Yolo.	May-Oct Annual Herb	None: no suitable habitat present.
Atriplex joaquiniana San Joaquin spearscale	Federal (FSC) State none CNPS 1B 2-2-3 Other DFG: Special Plant	Occurs in chenopod scrub, meadows, playas, shadscale scrub, valley and foothill grassland Substrate: alkaline. Recorded from Alameda, Colusa, Contra Costa, Glenn, Merced, Monterey, Napa, Sacramento, San Benito, San Joaquin, Santa Clara, Solano, Tulare, Yolo.	Apr-Oct Annual Herb	None: marginally suitable habitat present. Would have been detectable.
Ericaceae - Heath Family				
Arctostaphylos auriculata Mt. Diablo manzanita	Federal none State none CNPS 1B 3-1-3 Other DFG: Special Plant	Occurs in chaparral Substrate: sedimentary sandstone. Recorded from Contra Costa.	Jan-Mar Shrub (evergreen)	None: no suitable habitat present.
Fabaceae - Legume Family				
Astragalus tener var. *tener* alkali milk-vetch	Federal (FSC) State none CNPS 1B 3-2-3 Other DFG: Special Plant	Occurs in alkali sink, playas, valley and foothill grassland, vernal pools vernally-flooded, alkaline, Habitats Note: clay alkaline. Recorded from Alameda, Contra Costa, Merced, Monterey, Napa, San Benito, San Francisco, San Joaquin, Santa Clara, Solano, Sonoma, Stanislaus, Yolo.	Mar-Jun Annual Herb	None: marginally suitable habitat present. Would have been detectable.

Potentially Occurring Special-status Plant Species Evaluated For The Sand Creek Road Extension Project

FAMILY *Scientific Name* Common Name	Status		Habitat Affinities And Reported Distribution	Blooming Time Life Form	Potential For Occurrence On Site
Lathyrus jepsonii var. *jepsonii* Delta tule pea	Federal State CNPS Other	(FSC) none 1B 2-2-3 DFG: Special Plant	Occurs in freshwater marsh, marshes and swamps. Recorded from Alameda, Contra Costa, Napa, Sacramento, San Joaquin, Santa Clara, Solano.	May-Sep Perennial Herb	None: no suitable habitat present.
Geraniaceae - Geranium Family					
California macrophylla round-leaved filaree	Federal State CNPS Other	none none 2 2-3-1 DFG: Special Plant	Occurs in cismontane woodland, foothill woodland, valley and foothill grassland. Recorded from Alameda, Butte, Colusa, Contra Costa, Fresno, Glenn, Kern, Kings, Lake, Lassen, Los Angeles, Merced, Monterey, Napa, Riverside, San Benito, San Diego, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Solano, Sonoma, Stanislaus, Tehama, Ventura, Yolo.Santa Cruz Island.Also recorded from Baja California, Oregon, Utah.	Mar-May Annual Herb	None: no suitable habitat present.
Lamiaceae - Mint Family					
Scutellaria galericulata marsh skullcap	Federal State CNPS Other	none none 2 2-2-1 DFG: Special Plant	Occurs in freshwater marsh, lower montane coniferous forest, marshes and swamps, meadows, yellow pine forest Moisture: moist. Recorded from El Dorado, Lassen, Modoc, Nevada, Placer, Plumas, San Joaquin, Shasta, Siskiyou.Also recorded from Oregon.	Jun-Sep Perennial Herb (rhizomatous)	None: no suitable habitat present.
Liliaceae - Lily Family					
Calochortus pulchellus Mt. Diablo fairy-lantern	Federal State CNPS Other	(FSC) none 1B 2-2-3 DFG: Special Plant	Occurs in chaparral, cismontane woodland, foothill woodland, riparian woodland, valley and foothill grassland. Recorded from Contra Costa, Solano.	Apr-Jun Perennial Herb (bulbiferous)	None: no suitable habitat present.

Potentially Occurring Special-status Plant Species Evaluated For The Sand Creek Road Extension Project

FAMILY *Scientific Name* Common Name	Status	Habitat Affinities And Reported Distribution	Blooming Time Life Form	Potential For Occurrence On Site
Linaceae - Flax Family				
Hesperolinon breweri Brewer's western flax	Federal (FSC) State none CNPS 1B 2-2-3 Other DFG: Special Plant	Occurs in chaparral, cismontane woodland, foothill woodland, valley and foothill grassland Substrate: serpentine. Recorded from Contra Costa, Napa, Solano.	May-Jul Annual Herb	None: no suitable habitat present.
Malvaceae - Mallow Family				
Hibiscus lasiocarpus rose-mallow	Federal none State none CNPS 2 2-2-1 Other DFG: Special Plant	Occurs in freshwater marsh, marshes and swamps. Recorded from Butte, Colusa, Contra Costa, Glenn, Sacramento, San Joaquin, Solano, Sutter, Yolo.	Jun-Sep Perennial Herb (rhizomatous), Emergent	None: no suitable habitat present.
Papaveraceae - Poppy Family				
Eschscholzia rhombipetala diamond-petaled California poppy	Federal (FSC) State none CNPS 1B 3-3-3 Other DFG: Special Plant	Occurs in valley and foothill grassland Habitats Note: clay. Recorded from Alameda, Colusa, Contra Costa, San Luis Obispo, Stanislaus.	Mar-Apr Annual Herb	None: no suitable habitat present.
Polygonaceae - Buckwheat Family				
Eriogonum truncatum Mt. Diablo buckwheat	Federal none State none CNPS 1A * Other DFG: Special Plant	Occurs in chaparral, coastal scrub, northern coastal scrub, valley and foothill grassland Substrate: sandy. Recorded from Alameda, Contra Costa, Solano.	Apr-Nov Annual Herb	None: no suitable habitat present.

Potentially Occurring Special-status Plant Species Evaluated For The Sand Creek Road Extension Project

FAMILY *Scientific Name* Common Name	Status	Habitat Affinities And Reported Distribution	Blooming Time Life Form	Potential For Occurrence On Site
Ranunculaceae - Buttercup Family				
Delphinium recurvatum recurved larkspur	Federal (FSC) State none CNPS 1B 2-2-3 Other DFG: Special Plant	Occurs in chenopod scrub, cismontane woodland, foothill woodland, shadscale scrub, valley and foothill grassland Substrate: alkaline, Habitats Note: alkaline. Recorded from Alameda, Colusa, Contra Costa, Fresno, Kern, Kings, Madera, Merced, Monterey, San Luis Obispo, Solano, Tulare.	Mar-May Perennial Herb	None: no suitable habitat present.
Scrophulariaceae - Figwort Family				
Limosella subulata Delta mudwort	Federal none State none CNPS 2 2-3-1 Other DFG: Special Plant	Occurs in freshwater marsh, marshes and swamps Moisture: wet. Recorded from Contra Costa, Sacramento, San Joaquin, Solano.Also recorded from Oregon.	May-Aug Perennial Herb (stoloniferous)	None: no suitable habitat present.

Appendix B

Explanation of Special-status Codes

EXPLANATION OF SENSITIVITY STATUS CODES

ENDANGERED SPECIES ACT (ESA) LISTING CODES

FE = federally listed as Endangered
FT = federally listed as Threatened
FPE = federally proposed for listing as Endangered
FPT = federally proposed for listing as Threatened
FPD = federally proposed for delisting
FC = federal candidate; former Category 1 candidates
FSC = federal species of concern; receives no legal protection. Use of the term does not necessarily mean that a species will eventually be proposed for listing.

CALIFORNIA ENDANGERED SPECIES ACT (CESA) LISTING CODES

SE = state-listed as Endangered
ST = state-listed as Threatened
SR = state-listed as Rare
SCE = state candidate for listing as Endangered
SCT = state candidate for listing as Threatened

CALIFORNIA NATIVE PLANT SOCIETY DESIGNATIONS (CNPS)

List 1: Plants of highest priority
List 1A: Plants presumed extinct in California
List 1B: Plants rare and endangered in California and elsewhere
List 2: Plants rare and endangered in California but more common elsewhere
List 3: Plants about which additional data are needed
List 4: Plants of limited distribution

CNPS R-E-D Codes

R (Rarity)

1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2 = Occurrence confined to several populations or to one extended population.
3 = Occurrence limited to one or a few highly restricted populations, or present in such low numbers that it is seldom reported.
? = More data are needed

E (Endangerment)

1 = Not endangered
2 = Endangered in a portion of its range
3 = Endangered throughout its range
? = More data are needed

CNPS R-E-D Codes (continued)

D (Distribution)

1 = More or less widespread outside California
2 = Rare outside California
3 = Endemic to California
? = More data are needed

OTHER CODES

AFS: American Fisheries Society categories of risk for marine, estuarine and diadromous fish stocks.
Audubon: Watch List: Bird species facing population declines and/or threats such as loss of breeding and wintering grounds, or species with limited geographic ranges.
BLM: Sensitive: Bureau of Land Management. Includes species under review by FWS or NMFS, species whose numbers are declining so rapidly that federal listing may become necessary, species with small and widely dispersed populations, or species inhabiting refugia or other unique habitats.
CDF: Sensitive: California Department of Forestry and Fire Protection. Includes species that warrant special protection during timber operations.
DFG: CSC: California species of Special Concern.
DFG: Special Animal: Species included by the Department of Fish and Game in their special species lists.
DFG: Fully Protected: Species protected under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code.
FS: Sensitive: USDA Forest Service. Species identified by a regional forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or in habitat capability that would reduce a species' existing distribution.
FWS: BCC: Birds of Conservation Concern: migratory and non-migratory bird species (beyond listed species) that represent the FWS's highest conservation priorities.
FWS: MNBMC: US Fish and Wildlife Service: Migratory Nongame Birds of Management Concern. Species considered to be of concern in the U.S. due to documented or apparent population declines, small or restricted populations, or dependence on restricted or vulnerable habitats.
USMC Watch List: US Bird Conservation Watch List.
WBWB: High Priority: The Western Bat Working Group. Species imperiled or at high risk of imperilment based on available information on distribution, status, ecology, and known threats.

Appendix C

Vascular Plant Species Inventory

Inventory Of Vascular Plants At The Sand Creek Road Extension Site

8/10/2005

Sorted by CLASS, Family

Scientific Name	Common Name		Note
DICOTYLEDONES - DICOTS			
Amaranthaceae - Amaranth			
Amaranthus albus	tumbleweed	•	
Amaranthus blitoides	prostrate pigweed		
Asteraceae - Sunflower Family			
Carduus pycnocephalus	Italian thistle	•	3
Centaurea solstitialis	yellow star-thistle	•	3
Conyza bonariensis	flax-leaf fleabane	•	
Hypochaeris glabra	smooth cat's-ear	•	
Lactuca serriola	prickly lettuce	•	
Picris echioides	bristly ox-tongue	•	
Senecio vulgaris	common groundsel	•	
Silybum marianum	milkthistle	•	
Sonchus asper ssp. *asper*	prickly sowthistle		
Sonchus oleraceus	common sowthistle	•	
Xanthium strumarium	eastern cocklebur		
Boraginaceae - Borage Family			
Amsinckia menziesii var. *menziesii*	common fiddleneck		
Brassicaceae - Mustard Family			
Raphanus sativus	wild radish	•	
Sinapis arvensis	charlock		
Sisymbrium orientale	Indian hedgemustard	•	
Caryophyllaceae - Pink Family			
Stellaria media	common chickweed	•	
Chenopodiaceae - Goosefoot			
Chenopodium album	lamb's quarters	•	
Chenopodium murale	nettle-leaved goosefoot	•	
Salsola kali	Russian thistle		

Footnotes:

1 = federal or State listed Species 2 = other special-status species 3 = CALEPPC Listed Invasive Species

* = Species not indigenous to CA ** = Native Species not indigenous to site AG = agricultural species HORT = horticultural species

Inventory Of Vascular Plants At The Sand Creek Road Extension Site

8/10/2005

Sorted by CLASS, Family

Scientific Name	Common Name	Note
Convolvulaceae -		
Convolvulus arvensis	field bindweed	•
Euphorbiaceae - Spurge		
Chamaesyce maculata	spotted spurge	•
Fabaceae - Legume Family		
Lupinus bicolor	dove lupine	
Medicago polymorpha	burclover	•
Melilotus indicus	sourclover	•
Vicia sativa	common vetch	•
Geraniaceae - Geranium		
Erodium botrys	long-beaked storksbill	•
Erodium cicutarium	red-stemmed filaree	•
Erodium moschatum	white-stemmed filaree	•
Malvaceae - Mallow Family		
Malva nicaeensis	bull mallow	•
Malva parviflora	cheeseweed	•
Onagraceae - Evening		
Epilobium brachycarpum	tall willowherb	
Polygonaceae - Buckwheat		
Polygonum arenastrum	common knotweed	•
Rumex crispus	curly dock	•
Portulacaceae - Purslane		
Claytonia perfoliata	miner's lettuce	
Rosaceae - Rose Family		
Prunus dulcis	sweet almond	•
Scrophulariaceae - Figwort		
Veronica persica	Persian speedwell	•

Footnotes:

1 = federal or State listed Species 2 = other special-status species 3 = CALEPPC Listed Invasive Species

* = Species not indigenous to CA ** = Native Species not indigenous to site AG = agricultural species HORT = horticultural species

Inventory Of Vascular Plants At The Sand Creek Road Extension Site

8/10/2005

Sorted by CLASS, Family

Scientific Name	Common Name	Note
Ulmaceae - Elm Family		
Ulmus pumila	Siberian elm	•
Urticaceae - Nettle Family		
Urtica urens	dwarf nettle	•
Zygophyllaceae - Caltrop		
Tribulus terrestris	puncture vine	•
MONOCOTYLEDONES - MONOCOTS		
Poaceae - Grass Family		
Avena fatua	wild oats	•
Avena sativa	cultivated oat	•
Brachypodium pinnatum	pinnate false-brome	
Bromus diandrus	ripgut brome	•
Bromus hordeaceus	soft chess	•
Hordeum murinum	foxtail barley	
Lolium multiflorum	Italian ryegrass	•
Phalaris paradoxa	paradox canarygrass	•
Poa annua	annual bluegrass	•
Polypogon monspeliensis	annual rabbitsfoot grass	•
Vulpia myuros	zorro grass	•

Footnotes:

1 = federal or State listed Species 2 = other special-status species 3 = CALEPPC Listed Invasive Species

* = Species not indigenous to CA ** = Native Species not indigenous to site AG = agricultural species HORT = horticultural species

APPENDIX H

BAEFSKY & ASSOCIATES

ENVIRONMENTAL CONSULTING

October 4, 2006

Mr. Reed Onate
Denova Homes
333 Civic Drive
Pleasant Hill, CA 94523

Subject: Trees at Sciortina Ranch, Brentwood

Dear Mr. Onate,

The following memo includes a map locating all existing trees of four-inch caliper or greater. A total of seventy-nine trees within and adjacent to the proposed development were located on an aerial photo, identified to species, measured and evaluated in terms of health/vigor and structural soundness.

Within the approximately sixty-six acre property twenty-three trees were measured at 4.5 feet above grade, located on the map and evaluated. They are indicated by the letters "A-W" on the enclosed map and table. Trees on site range in condition from Dead to Fair. Species on site include Fruitless mulberry, Purple leaf plum, Aleppo pine, Siberian elm, Almond, and Apricot. None of the trees that were located on this site are oak trees, and are thus not indicated for preservation under the City of Brentwood Ordinance No. 17.470.006.

Along Brentwood Blvd., fifty-six City maintained street trees were assessed, measured and identified to species. They are indicated by the numbers "1-56". Street trees were in good to fair condition. Species include the upright variety of European hornbeam and the non-native Virginia oak. These species do not appear to be preserved species in the City of Brentwood under City Ordinance No. 17.470.006.

Respectfully submitted,

FILE COPY
DO NOT REMOVE
FILE # TSM 9152

Michael Baefsky
Certified Arborist #WE0222A

RECEIVED
OCT 06 2006
CITY OF BRENTWOOD
COMMUNITY DEVELOPMENT DEPT.

P.O. Box 311, ORINDA, CA 94563 Baefsky-Associates@sbcglobal.net 925.254.7950 – Phone 925.254.4729 - Fax

ARBORIST INVENTORY & ASSESSMENT

LETTERS "A-W" I.D. = ON-SITE TREES;-NUMBERS "1-23" = OFF SITE TREES ON BRENTWOOD BLVD.

ID	SPECIES	CALIPER	CIRCUMFERENCE (inches)	RATING (0-5)	CONDITION	NOTES
A	Fruitless mulberry	18.47	58	3	FAIR	very poor structure, intermediate vigor
B	Purple leaf plum	6.05	19	1	VERY POOR	globose scale, dying, measured @18"
C	Purple leaf plum	6.25		1	VERY POOR	measured @ grade
D	Purple leaf plum	8.00		1	VERY POOR	measured @ grade
E	Aleppo pine	7.00		2	POOR	lying on ground, ok vigor
F	Fruitless mulberry	27.23	85.5	2	POOR	poor structure, ok vigor
G	Fruitless mulberry	4.75,7		1	VERY POOR	dying
H	Fruitless mulberry	22.61	22,49	1	VERY POOR	dying
I	Fruitless mulberry	13.69	43	0	DEAD	
J	Fruitless mulberry	20.06	63	1	VERY POOR	measured at 1'
K	Siberian elm	45.22	142	2	POOR	poor structure, fair vigor, several large scaffold failures
L	Siberian elm	23.25	60,13	2	POOR	poor structure low vigor
M	Siberian elm	26.75	84	3	FAIR	fair structure, intermediate vigor
N	Almond	18.15	57	2	POOR	poor structure low vigor
O	Almond	3.00		1	VERY POOR	measured @ grade, bark gnawed
P	Almond	2.00		1	VERY POOR	measured @ grade, bark gnawed

ARBORIST INVENTORY & ASSESSMENT

ID	SPECIES	CALIPER	CIRCUMFERENCE (inches)	RATING (0-5)	CONDITION	NOTES
Q	Almond	4.00		1	VERY POOR	measured @ 2.5',falling;
R	Apricot	3.75		1	VERY POOR	measured @1'
S	Siberian elm	1,1,1,1,1,1,2,2,2,3,3.4,3.5,3.5		2	POOR	stump sprout
T	Siberian elm	5.5,6.4.25,6,1,1,3		3	FAIR	stump sprout
U	Siberian elm	19.11	33,15,6,6	3	FAIR	poor structure
V	Siberian elm	34.71	15,46,35,13	3	FAIR	poor structure
W	Siberian elm	3,2,1,1,2		1	VERY POOR	stump sprout
1	Island oak	4.00		3	FAIR	rooting zone disturbed
2	Island oak	4.00		4	GOOD	
3	Island oak	4.25		4	GOOD	girdling roots
4	Island oak	4.00		4	GOOD	bubbler at trunk
5	Island oak	5.50		4	GOOD	bad pruning cuts
6	Island oak	4.00		4	GOOD	bad pruning cuts
7	Island oak	3.75		3	FAIR	ground squirrel damage to roots, bad pruning, salt burn
8	Siberian elm	4.50		4	GOOD	
9	Island oak	5.00		4	GOOD	embedded ties
10	Island oak	3.75		4	GOOD	
11	Island oak	3.25		3	FAIR	stunted, very bad pruning
12	Island oak	4.00		3	FAIR	girdling roots, groundsquirrel root damage
13	Island oak	3.75		4	GOOD	
14	Island oak	4.50		4	GOOD	
15	Island oak	4.00		4	GOOD	
16	Island oak	3.50		4	GOOD	

ID	SPECIES	CALIPER	CIRCUMFERENCE (inches)	RATING (0-5)	CONDITION	NOTES
17	Island oak	4.25		4	GOOD	
18	Siberian elm	2.25		3	FAIR	salt burn, stakes & ties, ants, d@3'
19	Siberian elm	2.50		3	FAIR	salt burn, stakes & ties, ants, d@3'
20	Siberian elm	2.00		3	FAIR	salt burn, stakes & ties, ants, d@2.5
21	Siberian elm	1.00		2	POOR	salt burn, stakes & ties, stunted
22	Siberian elm	2.00		3	FAIR	salt burn, stakes & ties, ants
23	Siberian elm	2.00		3	FAIR	saltburn, stakes & ties
24	Siberian elm	1.25		3	FAIR	saltburn, stakes & ties
25	Siberian elm	1.25		3	FAIR	saltburn, stakes & ties
26	Siberian elm	2.00		3	FAIR	saltburn, stakes & ties
27	Siberian elm	2.00		3	FAIR	saltburn, stakes & ties
28	Island oak	4.00		4	GOOD	poor pruning
29	Island oak	5.00		4	GOOD	poor pruning
30	Island oak	4,2,2.25		3	FAIR	very poor pruning,
31	Island oak	5.25		3	FAIR	measured at 4'poor structure, poor pruning, ladybird beetle
32	Island oak	4.25		4	GOOD	
33	Island oak	3.75		3	FAIR	poor pruning, stunted
34	Island oak	4.25		3	FAIR	poor pruning, minimal taper
35	Island oak	5.25		3	FAIR	poor pruning
36	Island oak	5.00		3	FAIR	poor pruning
37	Island oak	5.50		4	GOOD	
38	Island oak	4.00		4	GOOD	ladybird beetle

ID	SPECIES	CALIPER	CIRCUMFERENCE (inches)	RATING (0-5)	CONDITION	NOTES
39	Island oak	5.00		4	GOOD	poor pruning, ants
40	Island oak	5.00		4	GOOD	ants
41	Island oak	4.00		4	GOOD	
42	Island oak	4.00		4	GOOD	
43	Island oak	3.75		4	GOOD	
44	Island oak	5.25		4	GOOD	measured at 4'
45	Island oak	5.50		3	FAIR	girdling root
46	Island oak	4.50		4	GOOD	measured at 4'
47	Island oak	5.25		4	GOOD	measured at 3.5'
48	Island oak	5.25		4	GOOD	measured at 3.5'
49	Island oak	4.75		3	FAIR	measured at 3.5', poorly pruned
50	Island oak	5.25		4	GOOD	
51	Island oak	4.50		4	GOOD	
52	Island oak	4.25		4	GOOD	ants
53	Island oak	4.00		4	GOOD	
54	Island oak	4.25		4	GOOD	
55	Island oak	4.25		3	FAIR	poor pruning
56	Island oak	5.25		3	FAIR	poor pruning

APPENDIX I

THE RESULTS OF A CULTURAL RESOURCE EVALUATION OF THE SCIORTINO RANCH PROJECT, BRENTWOOD, CONTRA COSTA COUNTY, CA.

SUBMITTED BY KATHERINE FLYNN, ARCHAEOLOGICAL RESOURCE SERVICE

SUBMITTED FOR THE CITY OF BRENTWOOD PLANNING DEPARTMENT, NEW URBAN COMMUNITIES PARTNERS, LLC (NUCP, LLC), AND RANEY PLANNING AND MANAGEMENT, INC. (RPM)

January 9, 2009 **A.R.S. Project #08-076A & B**

INTRODUCTION

New Urban Communities Partners, LLC of Pleasant Hill (NUCP, LLC) proposes to build a residential and commercial development within the property known as the Sciortino Ranch in the town of Brentwood, Contra Costa County. The project area consists of three parcels (APNs 016-170-011, -012, and -013) totaling about 65.0+ acres and is located on the east side of Brentwood Boulevard at its intersection with the future extension of Sand Creek Road.

The need for a cultural resource assessment of the Sciortino Ranch project is based on the findings and recommendations given in a cultural resource study conducted by an archaeologist and historian, who were part of a larger program-level study that was initiated in 2007. That earlier study was incorporated into the EIR document that was prepared on the Brentwood Boulevard Specific Plan by Raney Planning & Management, Inc. (RPM); the EIR was completed in April 2008. Holman and Associates, the archaeologists (H&A), conducted a records search and an archaeological sensitivity assessment while Ward Hill, Historian made an evaluation of historical structures within the Specific Plan area (Holman and Associates 2007a, b; Ward Hill 2007). The previous cultural resource study recommended in the future when specific development plans are submitted for a property within the Specific Plan area (that has) moderate archaeological sensitivity that it would be necessary to conduct more detailed analysis to assess potential project-level impacts to cultural resources. Now that an application to develop the Sciortino Ranch has been submitted to the City of Brentwood for zoning and General Plan amendments, a project-level cultural resource evaluation is necessary to assess possible impacts from development. ARS was retained to conduct the required studies that began with a similar records search and then a physical inspection of the project area.

The archival review found that the project area has moderate archaeological sensitivity; this is based on its environmental setting (proximity to Marsh Creek, a known sensitive natural resource) and review of the reports on other evaluated properties in the area which exhibit similar physical settings. Based on recommended procedures from earlier studies we then advised that before development begins it would be appropriate to conduct an inspection. The survey will determine if any prehistoric or historic archaeological materials are present on the surface and whether there is a potential that cultural materials might be found during future underground construction.

ARS prepared a preliminary draft report for NUCP, LLC at the completion of the review of existing archival data. However once we acquired the data from the earlier (2007) cultural resource study (summarized in the 2008 Brentwood Boulevard Specific Plan EIR), the recommendations were incorporated into the current document that also discusses the survey results of 2008. The Sciortino Ranch survey did not find any surface evidence of prehistoric sites or isolated artifactual materials nor have any discoveries been made on any of the adjoining properties that have been examined. Both the current (ARS) and prior (H&A) record searches have concluded that there is a slight potential that prehistoric archaeological materials might be found during construction, particularly in deeply buried native alluvial soil deposits that are likely to be uncovered.

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While no prehistoric materials were found, the survey identified three concrete slab foundations as well as some walnut, fruit and other trees, and related domestic artifactual materials in one area within the Sciortino Ranch project area. These former buildings appear to be greater than 45 years of age and thus might be considered to be possibly eligible as historic resources under the criteria of the State of California Office of Historic Preservation. Because it is likely that these foundation remnants, the related surface-visible domestic trash deposits, and landscape (trees) features will be removed to build the future development and this activity might be considered to pose an adverse effect to possibly significant historic resources, ARS has formally recorded and documented these remnant architectural features. Using the State eligibility criteria the study concluded that none of these features met the criteria for listing on the California Register of Historic Resources. Since these features would not be considered eligible as significant historic (archaeological) resources, they would not warrant further study or protection/preservation prior to construction. Archaeological monitoring does not seem to be necessary during earth disturbing activities but caution should be taken because there is a potential that deeply buried prehistoric or historic artifacts and/or features might be uncovered. In that event and before construction activities resume in that area, the discovered materials will require proper recordation and possibly recovery using scientifically approved methods.

PROJECT DESCRIPTION

Archaeological Resource Service has been retained to undertake a literature evaluation and surface reconnaissance of the project area. This report on the cultural resource evaluation describes the results of the archival review and inspection and then provides recommendations about mitigation procedures that should be applied on the development. The results of this evaluation have been submitted to the City of Brentwood and RPM and are to be included as part of an EIR under preparation by RPM on the Sciortino Ranch development.

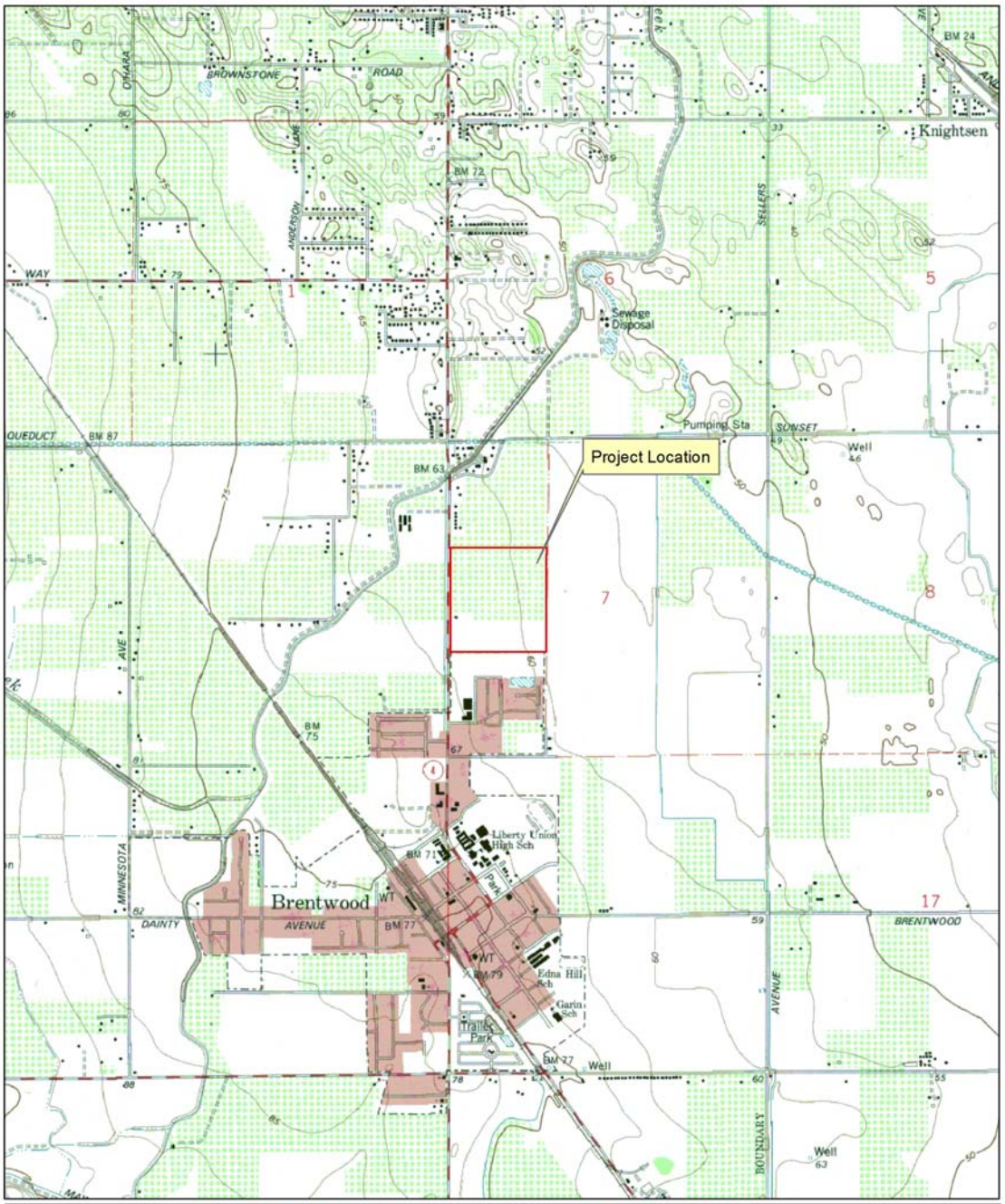
PROJECT LOCATION

The Sciortino Ranch area is bordered on at least three of its four sides by either existing subdivisions or planned residential communities and on the west side is Brentwood Boulevard/Highway 4; a commercial business complex has been built directly across the boulevard to the west. The channel of Marsh Creek is located approximately one-half miles to the north and west of the project area, across the Boulevard/highway and towards the formerly agricultural area that now has been built up with subdivisions and mixed-use commercial developments.

The project area lies within the northwest and southwest quarters of Section 7, in Township 1 North, Range 3 East, Mt. Diablo Base and Meridian (Figure 2). The Universal Transverse Mercator Grid coordinates to the approximate center of the project area, as determined by measurement from the Brentwood USGS 7.5' topographic quadrangle map (1978) are:

4200600 Meters North

614800 Meters East, Zone 10



ARS 08-076: Sciortino Ranch Subdivision (APNs 016-170-011, -012, -013)
Brentwood Boulevard, Brentwood, Contra Costa Co.

USGS 7.5' Brentwood Quadrangle Map (1978)

0 0.25 0.5 1 1.5 Miles

Archaeological Resource Service

Project Location Map

NATIVE AMERICAN CONSULTATION

When ARS was retained to conduct the inspection of the project area, we initiated consultation with the Native American Heritage Commission in Sacramento (correspondence attached). In this letter we requested that the NAHC undertake a review of the Sacred Lands Inventory file for this location and supply us with a list of

appropriate organizations or individuals who we should contact regarding this project. ARS received their response in early December after the initial draft records search had been completed. Once the response was received we sent out the required letters to the three listed individuals and/or organizations requesting their comments (the letters are appended to this report). To date no response has been received but if comments are received they will be sent to the appropriate agency or the applicant for their records. ARS will revise this report if necessary to include any information that may be supplied from these informants.

ARCHIVAL REVIEW

ARS has examined all available archaeological studies on properties within close proximity to the study area. The most important of the cultural resource studies is the program-level work on the Brentwood Boulevard Specific Plan project area that was conducted in 2007 by Holman and Associates and Ward Hill, Historical Consultant (Holman and Associates 2007; Ward Hill 2007). Both of these studies were summarized in the April 2008 EIR that was prepared by RMP for the April 2008 EIR which ARS learned about during the preparation of the current report now under preparation that incorporates the survey results. In addition to the documents that were reviewed in the earlier report prepared by ARS on the preliminary archival review, ARS has now read the summarized versions of these two studies and whenever pertinent comments or data was acquired, we have attempted to cite these earlier documents or utilize the maps in this program-level investigation to improve our work.

The initial archival review for the Sciortino Ranch project began by making an examination of standard reference documents in ARS possession. Our library contains documents and the report files on properties that have been the subject of archaeological evaluation in Contra Costa County (and the neighboring Alameda County area as well). The ARS files also contain copies of topographic and historic reference maps which show areas within a particular county that may have been evaluated by professional archaeological and/or historical consultants; particular attention was given to evaluated properties that are part of commercial or residential development or public works projects. The archival review sought to get details about the prehistory, ethnography, history, and general physical environment of eastern Contra Costa County and the larger Sacramento Delta region to the north. Particular interest was centered on gathering information about what is known about the history of land use in the project area (east Brentwood) and properties in the immediate surroundings starting from the mid nineteenth century to the present (fall of 2008).

In addition to using existing material in our files, the archival review was supplemented with pertinent documents acquired from the Northwest Information Center of the California Historical Resources Information System (hereafter listed as the NWIC of the CHRIS). The NWIC is the repository for reports and map data showing the locations of surveyed properties and recognized cultural resources located in Contra Costa County. The NWIC also places upon these base maps the locations of prehistoric and historical archaeological sites and historical resources (structures or buildings) that have been identified and officially recorded as a result of any archaeological or historic evaluations. So during the records search we specifically looked for reference documents pertaining to those evaluated properties within the central and eastern portions of the town of Brentwood. When Ms. Cassandra Chattan of ARS conducted the archival review on the Sciortino Ranch project at the NWIC in mid-October of 2008, they assigned the File Number of 08-0529. When ARS conducted the data search at the NWIC in November of 2008 Ms. Chattan did not find any of the 2007 reports that were prepared by Holman and Associates or Ward Hill. For the EIR. ARS still does not have copies of these reports but we have used the versions that were summarized in the April 2008 EIR.

Upon reading the EIR chapter on Historical and Cultural resources, it appears that it is the policy of the City (formerly town) of Brentwood (Policy #2.2) to preserve archaeological resources that are known to the community. Apparently the City maintains maps and copies of pertinent reports about these cultural resources are on file at the planning department. Archival and map research indicates that none of the archaeological sites that are known to the planning department are located in close proximity to the Sciortino Ranch area or within the Brentwood Boulevard Specific Plan Area. Therefore the proposed development would not physically threaten any previously known historic or prehistoric resource. However the Brentwood Boulevard Specific Plan area and currently undeveloped properties within the area, including the three parcels that make up the Sciortino Ranch development project, contain areas of moderate to low archaeological sensitivity, either because they might contain prehistoric archaeological sites or historic structures that might be more than 45 years of age or older.

After making an initial review of all of the properties that are located within the Brentwood Specific Plan area and then assessing the general sensitivity on a program-level basis, the following general statement regarding archaeological resources was inserted into the EIR:

> *Although archaeological resources were not identified in what is now the proposed Brentwood Boulevard Specific Plan area, the findings of the Archaeological Literature Review indicate that the proposed project is located in an area of moderate to high archaeological sensitivity, based on the project area's environmental setting.*
>
> *Two factors affect archaeological sensitivity in the Specific Plan area: the riparian zone around Marsh Creek, which was a favored prehistoric habitat of the Native Americans and the area of high dunes in the northern portion of the Specific Plan area." [Underlined for emphasis.]*

Under "Implementation of (archaeological) Mitigation Measure(s)," H&A made a recommendation that there were "certain properties" within the Northern, Central and Southern sub-areas of the proposed Specific Plan that should be visually inspected in their entirety by a qualified archaeologist. Several parcels were specifically listed as deserving scrutiny and demarcated on Figure 4.7- 4 of the summarized version in the EIR. The selection criterion used to guide which properties would be selected for visual inspection for archaeological resources (once proposed for future development) seems to be those with the closest physical proximity to the eastern bank of Marsh Creek. However the larger two parcels within the Sciortino Ranch project area (Property No. 235) were not specifically identified as possibly having high historic or archaeological value or outlined as being (suitable for evaluation) when proposed for later development.

While ARS is uncertain as to the exact specifics of the survey selection process that H&A used to guide their recommendations on future candidates for evaluation, there was a general recommendation made in the summary in the program-level assessment that an archaeological monitoring program be made a component of the mitigation program. In addition in having an explicit mitigation program they also added specific language about what would occur if potentially significant materials were discovered during grading or later construction.

After the archaeological study by H&A there was a separate "windshield" survey of Historic Architectural Resources conducted in September 2007 by Ward Hill, Historian; the results of this evaluation also were summarized in the April 2008 EIR. Out of the 41 vacant or predominantly vacant (*) parcels within the Specific Plan area that totaled approximately 241 acres and which contain the remnants of former agricultural activities, the survey for Historic Architectural resources identified a total of 75 buildings. These existing buildings were considered historic resources for purposes of compliance with CEQA. According to the summary twenty-six (26) of these buildings were apparently more than 50 years of age and therefore Ward Hill considered that they warranted an evaluation to rate their historic eligibility. The assessment was based on visual qualities, age, and whether the building retained historic integrity. None of these structures are present within the current project area.

ARS reviewed the maps that were attached to the EIR and concludes that the windshield inspection that was conducted by H&A along the east side of Brentwood Boulevard would have included the larger portion of the Sciortino Ranch (Property 235) and the small parcel known as Property 236 immediately south and below the intersection with the future extension of Sand Creek Road (that goes through the Sciortino Ranch property to the have conducted a specific physical inspection of the three parcels that are located within the Sciortino Ranch development project area.

However based on our review we concur with both Holman & Associates and Ward Hill that the proposed Sciortino Ranch project is located in an area of moderate archaeological and historical sensitivity. Although there are no standing structures still extant within any of the three parcels, there are former remnants of these earlier buildings, which are now demolished leaving their foundations and associated domestic debris etc. It is probable that these former building remnants would require some form of examination to be in full compliance with CEQA. Thus a physical inspection is warranted to develop a series of appropriate mitigation procedures to be implemented when construction begins to minimize potential disturbance to prehistoric or historic archaeological artifacts or features that might be encountered in less compromised underground settings.

SPECIFIC RECORDS SEARCH

The goal of the literature research has been to acquire locational and descriptive information for archaeological sites, historic resources and surveyed tracts in the area shown on the Brentwood 7.5-minute USGS topographic map sheet. The search has specifically sought the locations of any prehistoric and historical archaeological sites and historical resources (structures or buildings) that may have been identified and officially recorded as a result of these evaluations.

In addition to the information compiled from the NWIC search we have consulted with other consultants working in Contra Costa County and particularly in the Brentwood area about archaeological sites and historic resources. Specifically we are interested in discovering if any new archaeological sites may have been discovered during recent work in Brentwood, especially if there are any prehistoric sites that are not yet known to the NWIC.

All of the acquired data has been examined to prepare a cultural resource overview about the specific project area and the general vicinity. Based on the results of this overview and/or archaeological site record forms, we have assessed the archaeological sensitivity of the project area. Most of the documents seem to indicate that few if any of the proposed project areas have high archaeological sensitivity. But most of the researchers conclude that the surveyed properties all seem to have moderate or medium archaeological sensitivity. This is based simply on location, physical geography, and relationship to water or natural resources that might have an economic use to aboriginal or prehistoric inhabitants.

Although the Sciortino Ranch project area does not contain any remaining standing structures and it has been an agricultural field for many years, it is apparent that a residential building and other structures formerly occupied a part of the project area, in particular the small parcel on Brentwood Blvd near the western junction with the future extension of Sand Creek Road (Parcel No. 236 in the Specific Plan area). There is no indication that any structure or building in the project area has been identified as being a highly important historic resource. However similar to several other nearby parcels, structures dating from the late nineteenth or early twentieth century still do (or did) exist and may warrant further evaluation to determine their architectural merit or historical importance. An evaluation would be appropriate especially if the building/structure is greater than 45 years of age and is likely to be affected (or removed) as a part of future development.

It was the goal of ARS in the archival review to identify if any existing archaeological site or historic resource had been identified within the specific project area and adjacent parcels, or within any property whose physical location or environmental setting was highly similar. ARS assumed that many of these recent residential/commercial developments that have been proposed in the Brentwood planning area have been evaluated by consultants to determine the environmental impacts of specific projects (on potential cultural resources). Apparently archaeologists and historians would be employed to assess the archaeological sensitivity of the properties and if it was determined that any archaeological sites or potential historic resources were discovered and might suffer inadvertent harm by proposed development, the consultants would provide recommendations on appropriate mitigation measures that would be implemented when the development began.

When we initiated the records search and began reviewing then available reports on surveyed properties and ethnographic or historic reference material, it was our assumption that there was an implicit estimation that the majority of evaluated project areas possessed moderate archaeological sensitivity. However none of the evaluated parcels have been found to contain evidence of concentrated prehistoric artifactual materials or important historic buildings or structures. ARS was unaware until very recently that the City of Brentwood had commissioned a program-level review of existing information about cultural resources (archaeological sites and historic buildings) that possibly might be located within the Brentwood Boulevard Specific Plan Area. The cultural resource review was conducted as part of an EIR under preparation in 2008 by Raney Planning and Management (RPM).

Once ARS became aware of the archaeological and historical studies that were summarized in the 2008 EIR, we made an effort to incorporate data from those evaluations wherever appropriate in the current document. However the three parcels that are within the Sciortino Ranch project area: 1) do not contain standing structures and thus were not evaluated by the historian and 2) were located outside the limits of the properties considered to have the highest archaeological sensitivity. The project area is not located along the channel of Marsh Creek and it is not on the west side of Brentwood Boulevard and thus it does not have the highest sensitivity.

During the current research we hoped to specifically look at those reports that provide relevant information about general aboriginal or historic settlement patterns in the nearby Delta area or regional models of archaeology and ethnography. For instance Colin Busby of Basin Research Associates conducted a study in 2000 about a 160-acre parcel on Sunset Road (APN 016-190-008), east of Brentwood Blvd/Hwy 4 and north of Sycamore Avenue (if extended east) (Busby 2000; S-24955). While the study proved entirely negative for either prehistoric or historic resources, Busby made reference to two earlier studies, both of which involved the northeast portion (of the Sunset Road property). One area was evaluated as part of the studies referred to as US Bureau of Reclamation (1983) and Bramlette etal (1991) and a second evaluation was conducted by Basin Research Associates (Busby 1995). For instance in his section on the history of the parcel during the American period, Busby (2000) noted that Brentwood Boulevard was formerly known as Walnut Boulevard. He noted that all of the roads in the project vicinity (Sunset Road, Brentwood and Sellers Avenue) were in existence by 1914, but do not conform to the alignment of the 1860s roads. By 1938, an East Bay Municipal Utility District (EBMUD) aqueduct had been constructed along the north side of the (Sunset Road) parcel.

Basin Research Associates also conducted even an earlier study that seems to have provided relevant information about the history and prehistory of Brentwood (Busby 1976b in Busby 1976a). According to him, the (now) incorporated city of Brentwood lies in the Agricultural Plain and as of 1975 its population was about 4,300 people. The existing water system will continue to serve the Brentwood plant. According to his research in 1976 the closest officially recorded cultural resource, P-07-775, is situated about a quarter mile north of the project area; this resource is located within the existing Sewage Disposal Facility that has been recently evaluated for a planned expansion. The proposed project entails some upgrading of the plant and expansion of the land disposal area in the immediate vicinity. The expanded facility will also serve the unincorporated community of Sand Hill (population 2,630 in 1975). Busby described that the project area was currently in pasture but the presence of an orchard and the abandoned field prevented them from making a complete subsurface reconnaissance. There were no indications of cultural materials present on the surface.

Our review found yet another property in the general project area that was evaluated and may also provide pertinent information about how the context of archaeological sensitivity has been developed by researchers. This is the Hancock property (APNs 016-090-001 and -002); these two parcels are located at the confluence of Marsh and Sand Creeks. Busby (2002b) makes this comment in regards the Hancock property. The westernmost project parcel (-002) is located about 1400 feet from Marsh Creek and about 3000 feet from Sand Creek; the easternmost project parcel (-001) is located about 400 feet from Marsh Creek and about 0.75 mile from Sand Creek. According to his research these parcels would have been situated in a favorable environment during the prehistoric period with riparian and inland resources readily available and the Bayshore in relative close proximity.

During the discussion of the historic land usage, Busby (2002b) also mentions Dr. John Marsh, from whom Marsh Creek was named), who resided in this area around 1838. When Marsh began to settle on his Rancho Los Meganos grant he found several Native Americans living in the area; these Native peoples had apparently returned to the area at the end of 1836 after the secularization of Mission San Jose (near Fremont). Marsh apparently had good relations with the local Native Americans populations living in this area and they built his adobe dwelling for him on the bank of their *rancheria* (village) (Hoover etal 1966: 59-60; Bennyhoff 1977: 144 after Marsh 18190: 213; Milliken 1995: 229, Map 5, 246). [This adobe structure was later replaced by a stone house located nearby on Marsh Creek Road two and a half miles south of Brentwood. According to the footnote in Busby (2002b), the stone house is probably the most notable cultural resource in the general study area. It is listed on the National Register of Historic Places, the *California Inventory of Historic Resources*, it has been designated a Contra Costa County *Structure of Historical Significant/Architectural Specimen*, and it is also on the Contra Costa County Map of *Historical Points of Interest* (2002b: Footnote 6, p. 3).

Concluding our review, it has become evident that none of these earlier studies that were conducted in close proximity to the current Sciortino Ranch area. – especially those which were conducted before the late 1990s - have identified any local, state of federal historically or architecturally significant structures, landmarks, or points of interest on the evaluated parcels. However due to more stringent federal and/or State cultural resource guidelines that now require that buildings, structures, objects, and facilities of potential historic age, for instance such as the Contra Costa aqueduct and features related to the Southern Pacific railroad, be given close scrutiny.

Accordingly we now find that the Contra Costa aqueduct has been formally recognized as “historical resources” and were assigned Primary Numbers by the NWIC in later years.

Ric Windmiller conducted an extensive literature search, Native American consultation program, and field inspection of the 160-acre property known as the Barrington project area, for DeNova Homes in 2004 (Windmiller 2004b). Until ARS received the studies conducted on the Brentwood Specific Plan Area, we considered Windmiller’s 2004 documents to be some of the best/ most thorough reports that were gathered for the current records review. [Incidentally NUCP, LLC through its affiliate DeNova Homes also was the applicant for the earlier project that was evaluated by archaeologist Ric Windmiller, who is apparently not any relation to the Windmiller (a person) from whom the archaeological pattern is named.] In his overview on prehistory Ric Windmiller provided an excellent discussion of the settlement patterns that were followed by the Native American groups who had lived in the western Delta and Bay regions during the last two to three thousand years, what is considered the Middle and Late Horizon (according to James Bennyhoff and others).

According to Windmiller’s description of (the late Dr.) Bennyhoff’s seminal work, Bennyhoff had provided an updated overview of the Middle and Late period settlement patterns (Bennyhoff 1994: 81-89). It was Bennyhoff’s contention that the earliest phase of the Berkeley Pattern (of the Middle Horizon) was not simply a variant of the Windmiller Pattern as was suggested by Moratto (1984) and others. Bennyhoff had begun to prepare a slightly revised model of the settlement patterns, based on an analysis of human remains that had been recovered from several sites in the two areas. It appeared to Bennyhoff that two separate populations were represented. The Windmiller Pattern includes early period sites in the Sacramento, Cosumnes, and Stockton districts and well into the West Delta. Sites related to the Lower Berkeley Pattern were located around San Francisco, San Pablo and Suisun Bays (Bennyhoff 1994: Figure 8.1).

(According to Windmiller) Bennyhoff further contended that the Meganos Culture, which he identified in 1968, was the result of a “hybrid” Windmiller population intermarrying with people of the Berkeley Pattern. “Meganos” meant “sand mound,” referring to the non-midden cemeteries found in the sand mounds on (the) West Delta islands to the north of Brentwood such as those in the Hotchkiss Tract. [These “sand mound” sites were first described by Cook and Elsasser in 1954.] Bennyhoff asserted that the Meganos Culture rose between 500 and 200 B. C., that it was always centered in the San Joaquin Valley, but expanded into parts of the Bay Area by the late Middle period circa A. D. 300-700. Bennyhoff appears to have suggested that the Middle-Late Transition period, A. D. 700-900, was a period of disruption across Central California. With the southward expansion of Wintuan (speaking) peoples (from the upper Sacramento River area), who probably were the bearers of (artifacts associated with) the Augustine Pattern (of the Late Horizon), the Meganos peoples apparently began to retreat into the Sacramento Delta. The intruding Patwin, a Wintuan-speaking people, moved deep into the Solano District and apparently forced the resident ancestral Bay Miwok across the West Delta to the south side of Suisun Bay. The Ancestral Karkin Costanoans, who lived on the north side of San Pablo and Suisun Bays, also moved to the south across Carquinez Strait to join other Costanoans from whom they had been physically separated for 300 years. It was during this time, A. D. 700 to 900, that the Meganos cemeteries in the Alameda and Diablo districts were abandoned. Bennyhoff believed that an increase in the number of delta archaeological sites during this period signified the return of the Meganos peoples.

During the earliest phase of the Late Period, A. D. 900-100, Bennyhoff’s research indicated that the Bay Miwok expanded eastward into the West Delta, occupying the Hotchkiss Mound (CA-CCo-138) located near the present-day community of Bethel Island (that is now encompassed within the sphere of influence of Brentwood.) According to Windmiller, concomitantly the nearby Meganos cemeteries at sites CA-CCo-20 and CA-CCo-139 were abandoned. And again according to Windmiller the study of a late period Meganos cemetery in Stockton (CA-SJo-154) showed that the Meganos survivors integrated with the peoples known as the Valley Yokuts. By the period A. D. 1100-1300, a new settlement pattern was evident for the Stockton district (Bennyhoff 1994: 83 in Windmiller 2004b: 5-6).

Most of the other reports that have been examined to prepare this records search summarize the prehistory and history of the general Brentwood or eastern Contra Costa region. These documents pay particular attention to the major archaeological discoveries that have been made in the Hotchkiss District (recorded by Busby and Bard 1978) or areas to the northwest (like Los Vaqueros Reservoir) where numerous prehistoric and historic sites, features, and isolated prehistoric and historic artifactual and architectural remains have been found. The

Brentwood area appears not to contain much physical evidence of Native American activity on the presently visible ground surface. Other areas to the northeast or southwest seem to exhibit more locations where bedrock outcrops with mortar depressions or milling features have been recorded (the upper parts of Marsh Creek near Mt Diablo) or where extensive habitation sites with burial remains have been unearthed from beneath often thick layers of alluvium or peat deposits being cut and trenched through for modern construction (e.g., Los Vaqueros Reservoir or buried sites in the Delta islands.).

A few archaeologists working in the Brentwood area have made comments about the potential for discoveries in spite of the usually negative field results. For instance the following comment from Miley Holman (2006) is indicative that a more precautionary note should be attached to EIR reports even if the field investigation proved negative for evidence of prehistoric artifacts. While the findings of Holman's report (indicated) that future development of the project area will also have no effect on either historic and/or prehistoric cultural resources. Holman (2006) did not recommend archaeological monitoring of future development activities nor did he recommend that mechanical subsurface presence/absence testing be done of the eastern portion of the parcel where dense grasses made a visual inspection impossible.

However he did draw attention to the eastern portion of the (surveyed) property because it contained the channelized Marsh Creek; (as such it) may contain (what he considered to be) filled-in ancient meanders of the creek. He surmised that Its (the project area's) position at the base of the sand hill in an ancient flood zone makes it highly unlikely that future development in the area will uncover buried archaeological materials. The stated reason was (because) "since there may exist as much as 10 feet of silt covering what were ancient dry living surfaces which could have held prehistoric archaeological resource deposits" (p. 2). It would seem from the afore-mentioned passage that Holman was being realistic. While he could not (totally) disregard the potential for the discovery of surface artifacts of prehistoric association, he expected that a thick natural cover of alluvium would preclude most researchers' attempt to discover such materials during a standard surface-level archaeological survey program.

SUMMARY OF THE ARCHIVAL REVIEW

Although a relatively large number of archaeological reports were examined for this research project, the attached bibliography cites more than seventy separate documents (and Holman & Associates counted more than 40+ separate documents in their search), we have concluded that there are no identified cultural resources, either prehistoric archaeological sites or registered historic resources located within a quarter-mile radius of the project area. There are one or two newly recognized historic resources such as the Contra Costa aqueduct or former trestles used by the railroads, located in the general vicinity but none of these historic sites would be impacted by the Sciortino Ranch development.

A few minor rural (or vernacular style) homes and farms have been identified outside of this limit and were inspected and formally recorded but none were found to be eligible historic resources under the State CEQA or federal criteria (Windmiller 2004; Shoup 2006). A similar negative result is indicated for the slightly expanded one to two mile general search area, despite the presence of a few farm structures of greater than 45 years of age that were evaluated (e.g., Peak & Associates, Inc. 1990 on the Garin Ranch Specific Plan). All of the archaeological researchers whose documents were reviewed for this evaluation considered the general area to have a moderate sensitivity for prehistoric occupation. However, within this search area no prehistoric-era archaeological sites have yet been identified during any surface inspection or test excavation that was conducted (and reported upon). There are rumors of isolated prehistoric artifacts being found by earlier artifact collectors or excavating contractors but in the immediate Brentwood area, different than the Delta or the Hotchkiss Tract, buried sites seem to be a lot less likely to be found.

There are only two instances where an isolated and assumed prehistoric artifact was discovered; one in the arbitrary one mile search radius and the second just outside that radius but with a highly similar environmental setting, i.e., near a known stream (Kellogg Creek) (Baker and Shoup 2007). In the arbitrarily defined search radius, a single isolated prehistoric flake of weathered native Franciscan chert was discovered and this isolate was found on the surface of a tilled field that was formerly used for agricultural purposes. This isolated artifact was discovered during the study of the 85-acre parcel that was examined for the proposed Sunset Industrial Park near the city's municipal sewage facilities; Marsh Creek borders this industrial facility. This property was

surveyed by Jones & Stokes in 2001 for the City of Brentwood (Jones & Stokes 2001). No other items were found even though an exhaustive search was made by the archaeologist, who prepared a Primary Record form on this isolated find (Siskin 2001).

At the present time there are no registered historic structures or buildings located in the immediate vicinity of the project area. In addition there are relatively few structures of greater than 45+ years or older that have been evaluated in the general arbitrarily defined study limits. Of those that have been so evaluated none were considered to meet the eligibility criteria and the researchers did not argue for their continued preservation within the respective surveyed parcel. (that was proposed for eventual residential or commercial development).

ARCHAEOLOGICAL SENSITIVITY

Given the general environmental setting the project area lies in a relatively moderate to highly conducive environmental setting for aboriginal occupation. While the project area itself has not been examined prior to this investigation, the majority of adjoining land parcels and the Highway 4/Brentwood Boulevard right-of-way have been examined. The earliest inspection report that was evaluated for this report was conducted in 1974. This study encompassed the right-of-way of Highway 4 extending north to south east of the town center; the archaeological study was examined by District 04 Caltrans archaeologist Margaret Buss. No evidence of archaeological (prehistoric Native American) materials were discovered along that section of the boulevard/highway bordering the project area. However there was comment made about inherent difficulties due to the presence of paved surfaces, artificial fill soil, and modern landscape alteration limiting surface exposure.

Over the intervening years other properties also have been studied that border the Sciortino Ranch project area, including subdivision No. 6665 located to the south of the project area. Subdivision No. 6665 is a part of the large Garin Ranch Specific Plan area that was evaluated by the archaeological firm of Peak and Associates in 1990. Across Brentwood Blvd/Hwy 4 to the west is yet another development, in this case part of the proposed (and now completed) Sand Creek Business Center (APN 016-110-023, -024, and -028) that was evaluated and inspected by archaeologists in 1999 (Busby 1999a, b).

Along the southeast and northeast sides of the project property respectively are several other project areas that also have been evaluated: Subdivision 6200 is located to the north and Subdivisions Nos. 9096 and 8548 are located to the southeast. In the latter-most case (No. 8548) this 160-acre parcel situated along the east is located off of Sunset Road (APN 016-190-008). This property was initially examined by Basin Research Associates in 2000 (Busby 2000) and then evaluated again in 2004 by archaeologist Ric Windmiller (2004a, b) as part of the Barrington planned residential development.

The existing municipal wastewater treatment facility is located nearly one mile to the north and east. Beginning in 1976 the existing facility was evaluated beginning in 1976 (Busby 1976) and in later years the older existing and newly rehabilitated parts of this facility were also evaluated and examined by staff archaeologists working with Jones & Stokes (Jones & Stokes 1997, 1998a, b, c; Ashkar 1998a, b). This cultural resource evaluation was conducted for the City of Brentwood and reported upon in an EIR by Jones & Stokes.

HISTORIC BACKGROUND OF THE PROJECT VICINITY

The following is an overview based on a review of standard historical reference sources such as Smith & Elliott (1879); William Slocum (or Munro-Fraser) (1882), Historical Record Company (1926) and Mae Fisher Purcell (1940) as well as other documents prepared by archaeologists or other consultants that make use of much later historical references such as Hulaniski (1917); Dillon (1982); Collier (1983); Hoover etal (1966); or Emanuels (1986). In the 1882 History of Contra Costa County by W. A. Slocum (republished in 1974), there is a short section on Brentwood and other Diablo Valley communities; this community is located within Township Number Five whose boundaries are the San Joaquin River on the north and east; Alameda County to the south; and on the west by Townships Numbers Two and Four. Brentwood appears to have gotten its name from the town of Brentwood in Essex, England, from where the family of Dr. John Marsh originally came (Slocum 1882:496). The township's history begins nearly a half century earlier (than John Marsh's coming to the area) when the landgrant was under the ownership of several different Mexican-era families including Jose Miguel and Antonio Mesa, who applied in 1836 for the Los Medanos land grant. The same year an application was made for the Canada de los Vaqueros Rancho by Mirando Higuera and Alviso, who settled upon it; and the Rancho Los Meganos, consisting of three square leagues of land, was granted to Sr. Jose Noriega. In 1837 Noriega sold the Rancho to Dr. John

Marsh, who settled upon it that year and occupied it until 1856. During his tenure on the Rancho Los Meganos grant Marsh first built and lived in an adobe that was followed by the "stone house" that still exists.

Begun in the late nineteenth century as an agricultural section of the county, Brentwood apparently was transformed from an area where grain and hay was raised to an orchard and vegetable district, where in the author's opinion, "an almost limitless variety of high quality fruits and vegetables" were grown (Munro-Fraser/Slocum 1882: 734-735). The change in the landscape began when the Balfour-Guthrie Company acquired large areas of choice land and (started the company's development) with Brentwood as its base of operations. A modern irrigation system was constructed to take water from the San Joaquin River and to distribute it through a series of canals and pumping stations to the entire area.

Commercial planting of trees by the Balfour and Guthrie Inc. company began in a big scale in 1921; in that year two experimental orchards of apricots were established. Hundreds of additional acres of land were cultivated in the following years, with the following trees being planted: apricots, peaches, prunes, cherries, nectarines, and other fruit varieties. Commercial vegetable growing also commenced at the same time, due in great part to the favorable and abundant supply of water that was available, the mild climate and the long growing season, combined with the fertile soil. Tomatoes, lettuce, beans, peas, spinach, and cucumbers all were being grown in the valley. In 1922 other companies followed Balfour-Guthrie, including William T. Kirkman, D. D. Watson, H. P. Garin & Co., and others who established orchards in the Brentwood area and in the greater Diablo Valley.

The City of Brentwood was incorporated in 1948. While the city remained a predominantly rural agricultural community, the post-war population boom in the Bay Area changed the economic focus of the entire region. People could live in Brentwood area and commute to factory jobs in Pittsburgh and Martinez. Communities like Brentwood, Oakley and Knightsen have been expanding as a consequence.

Many of the parcels that have been selected for recent development have been used traditionally for agriculture or some other non-residential or minor-scaled commercial application. Consequently there is a reduced likelihood that structures of older construction will persist and be thus available for evaluation when a rural parcel is taken out of cultivation and proposed for development.

The Sciortino Ranch currently is an agricultural field. A brief review of the history of land usage of the surrounding properties that have been evaluated by archaeologists or historical consultants indicates that very few of them contained buildings or structures that would have warranted an inspection in the past. However the more stringent application of CEQA guidelines pursuant to properties that appear to be greater than 45 years of age now require that an historic evaluation be performed. There is minor mention of the presence of possible historic-age structures and buildings in the Garin Ranch Specific Plan study area evaluated by Peak & Associates, Inc. in 1990 and the later Barrington residential subdivision evaluated by consulting archaeological Ric Windmiller (2004a, b, and c). Both of these larger sized residential development projects are located in close proximity to the Sciortino Ranch property and reflect highly similar environmental and physical settings. But for the most part the existing buildings/structures that were subjected to evaluation were found to be ineligible.

In addition the 2008 Brentwood Boulevard Specific Plan EIR also incorporated a program-level evaluation of historic buildings located within the parcels along Brentwood Boulevard. There were a total of 75 buildings (or building complexes) in the Specific Plan area. Twenty-six buildings in the survey area appeared to be over 50 years old. An attempt was made to rank and rate each building according to degree of integrity and eligibility However very few buildings were found to retain integrity or be suitable for intense or formal study at that time but might warrant further evaluation if a specific development application were submitted. Because there were no standing buildings within the parcels within the Sciortino Ranch study area the project area was not physically evaluated by either an archaeologist or historical consultant.

ETHNOGRAPHY

According to cultural resource consultants such as Colin Busby who have worked in Brentwood the ethnographic affiliation of the aboriginal inhabitants of the general area at the time of European contact recently have been designated on the basis of linguistic evidence as belonging to the Bay Miwok (a sub-group of the Penutian family of languages which were widely spoken throughout the interior Central California (region) (Beeler 1955, 1959;

Bennyhoff 1961; Callaghan 1964: 46); Merriam 1955: 133-134 and Heizer 1966: 19 in Busby 1976b). The following is a direct quote from him (Busby 1976b: 1-3):

> *The Bay Miwok occupied the Diablo locality (as called by Bennyhoff (1961)), which includes Mount Diablo and the surrounding interior drainage region, the southern shore of Suisun Bay, and the Delta Region northwest of Mount Diablo. The Bay Miwok included the (tribelets known as the) Saklan (also spelled Saclan), Chupunes, Tarquines, Julpunes, and Ompines (Schenck 1926; Cook 1955) of which the last four groups are located within the (East/Central Contra Costa Wastewater) project boundaries. On the basis of early Spanish reports and mission records, Cook (1955: 64) estimated a population of 3,000 for the four groups and a total population of 9,350 for the tribes known to inhabit the delta region and the southern shore of Suisun Bay. This population was dispersed into many small villages or "tribelets" each having a loosely centralized organization around a principle (sic) village headed by a hereditary chief and a well defined territory for hunting, fishing, and gathering.*
>
> *Ethnographic information concerning these Indians is fragmentary and incomplete consisting mainly of baptismal records, brief vocabularies taken by the mission padres as well as explorers' and military accounts of the late 18th and early 19th centuries. Although no village names definitely assignable to these groups appear in the mission records, the San Francisco and San Jose missions drew on this portion of the delta region for "converts." Due to the missionizing efforts of the Spanish, it appears that by 1800 these groups, along with neighboring tribes, were virtually extinct having been decimated by disease, military conflict, disintegration of native lifestyles and probably widely scattered from their original aboriginal areas so that by the American period only scattered survivors remained. Consequently, very little direct information is available concerning the aboriginal lifestyle. However, some general statements may be offered as a brief sketch of native lifestyles in the delta region of Central California.*

In regards the subsistence practices of the native inhabitants, the Bay Miwok are known to have exploited the native shellfish of the area, which included mussels, clams, and other genera as well as anadromous fish (salmon and steelhead trout) and other near shore marine species. The principal means of fishing was by nets. Various species of wild fowl that lived in the marshes also were taken by net and via the use of decoys. Deer, as well as rabbits, squirrels and other small game, was hunted in the hills and valleys. In earlier times before the native environment was heavily affected by the historic and modern landscape alterations, other large game animals also were hunted including pronghorn antelope, elk, and brown and/or grizzly bears. However these larger game animals may have been hunted and their meat eaten for food, although they were apparently exploited for other uses as well. For instance the skins of grizzly bears were worn (as garments) and the pelts of bobcats or mountain lions might have been used to store arrows (that is, as a quiver) that would be used for hunting. Men were accustomed to go naked when the weather permitted, and women wore skirts of deerskin, shredded tule or bark fiber along with robes of woven rabbitskin that served both as cloaks and bedding (Kroeber 1925). Men often painted their bodies with earthen pigments and facial tattooing was customary among women. Shell ornamentation was common to both sexes and circular clam shell beads were strung and utilized as (items of) value (i.e., money) standards in trade and/or exchange networks. The aboriginal inhabitants made coiled and twined baskets; willow was the only plant that was definitely known to have been used in basket making by these groups from the Delta. Other types of basketry materials were used by other tribes who lived in the North Bay area.

PREHISTORIC SETTING

The following observations have been made about the prehistoric setting based on a review of the major reference documents that have been prepared about known archaeological (aboriginal) and ethnographic settlement patterns:

> *Most of the prehistoric archaeological sites in the Delta (region) are located on Piper sand dunes, which are situated slightly above the Delta peat and mud. These dunes were probably formed between 40,000 and 10,000 years ago, when the present-day Delta region was part of the river valley of the Sacramento and San Joaquin Rivers. When sea level rose approximately 11,000 years ago, the San Francisco Bay flooded and slowed the flow of these two river*

> *systems. The steady accumulation of sediments formed the Delta marshland and buried much of the Piper sand formation, laving only some of the dunes partially exposed (Holson etal. 1993).*
>
> *Prior to the reclamation of the marshland during the mid to late 1800's the Delta consisted of a mosaic of ecological zones including freshwater wetlands, riparian woodlands, and valley grasslands. Prehistoric populations are known to have exploited the plant and animal resources available in these varied habitats. Fish, turtles, and waterfowl were caught with nets, while rabbits, rodents, deer, elk, and other fur-bearing mammals were hunted using spears or bows and arrows. Tules were used to weave mats and to construct houses and canoes for travel between islands. Acorns, roots, nuts, and seeds were gathered for food (Maniery and Syda 1988 in Wick 2007a)).*

Although earlier use of the Delta area is suspected, any evidence of this occupational usage is likely buried beneath river alluvium and peat deposits and thus not easily observable given typical land alteration and modifications that has occurred in the historic and modern eras. The earliest evidence of use of the Delta area, known as the Early Period, dates from approximately 2,500 B.C. to 1,000 B. C. This period is characterized by (occupational deposits containing) shell ornaments, charmstones, large projectile points with concave bases and stemmed points, baked clay cooking balls, fishing implements (harpoons and spears), and various kinds of grinding tools. Burials were usually extended, face down, and oriented to the west (Moratto 1984).

Middle Period sites, which date from about 1,100 B. C. to A. D. 500, often overlie these earlier sites and consist of midden (culturally modified soil) deposits with shell, mammal and fish bone, charcoal, and grinding tools. Burials during this time were in a flexed, rather than extended, position. The Middle Period is also marked by an increase in the use of obsidian for tool manufacture, as well as (an increased variety) in shell (taxa) and the types of beads (made from shell), which indicates an increase in the complexity of exchange networks and social stratification (as compared to what was seen) during the Early Period.

The Late Period (also known as the Hotchkiss Tradition for a major burial site complex that was discovered within the Hotchkiss [Island] District in the Delta) dates from approximately A. D. 500 to A. D. 1800, which is when the Spanish entered the area, and disrupted the aboriginal patterns of subsistence and settlement. This period is characterized by village sites with large pit-houses located on high ground and an increase in salmon fishing and the processing of acorns and various nuts. Toward the end of the Late Period cremation burial becomes a more common mortuary practice than inhumation. Small, convex-based, side notched projectile points, which indicate the use of the bow and arrow, and (small) serrated projectile point forms, also become common during this time period. The presence of clam shell disc beads and glass trade beads indicates that the inhabitants participated in an extensive exchange system (with other tribal groups operating in the East or Southern Bay Area) (Chartkoff and Chartkoff 1984; Moratto 1984; Maniery and Syda 1988).

There are no recorded prehistoric sites located within a one to two mile radius of the project site and only the two isolated finds have been discovered during the studies of evaluated properties in the project vicinity; the discovery of these two lone artifacts was specifically mentioned in two of the reports that were examined to prepare this report. The relative near absence of recorded sites may reflect an incomplete sample or the difficulty that has been experienced by archaeologists when making an attempt to find evidence of an exposed well-developed midden soil or concentrated scatter of stone tools on the present ground surface. The presence of aboriginal or protohistoric village sites or activity areas may be especially difficult to see, especially after the formerly undulating (native) land surface has been leveled for intensive agriculture or (is now) covered by structures, pavements, or fill soil.

While few surface-visible prehistoric sites have been identified during surveys in the marshes and wetlands of the Delta and the islands along the southern shore of the Carquinez Straits, deeply buried archaeological sites with midden deposits and associated mortuary features have been found in the Hotchkiss Tract as discussed above (Busby and Bard 1978; Holson etal 1993). In other areas what seems to be numerous reported examples of so-called "isolated" chipped and ground stone implements as well as ritual or ceremonial ornaments (made of shell, stone, or bone) having been found during past historic-era land leveling operations and in construction activities undertaken for modern residential development projects (Cook and Elsasser 1956; Cook and Heizer 191962; ACRS n.d.; Busby 1976a, b; Gerike 1981; Parkman 1980; Busby etal 1996; Chavez 1988; Wick 2007a, b).

RESULTS OF SURFACE EXAMINATION

The 60+ acre project area was surveyed on November 25, 2008 by conducting east-west oriented transects with approximately 30-meters of separation between transects, starting at the north end. The northern half of the project area (north of the planned Sand Creek Road extension) was actively being de-vegetated and a large pile of soil stored at the northeast section of the property was being redistributed. A good amount of the soil was being placed along the north side of the Sand Creek Road extension. As a result of the de-vegetation the soil visibility was approximately 95%.

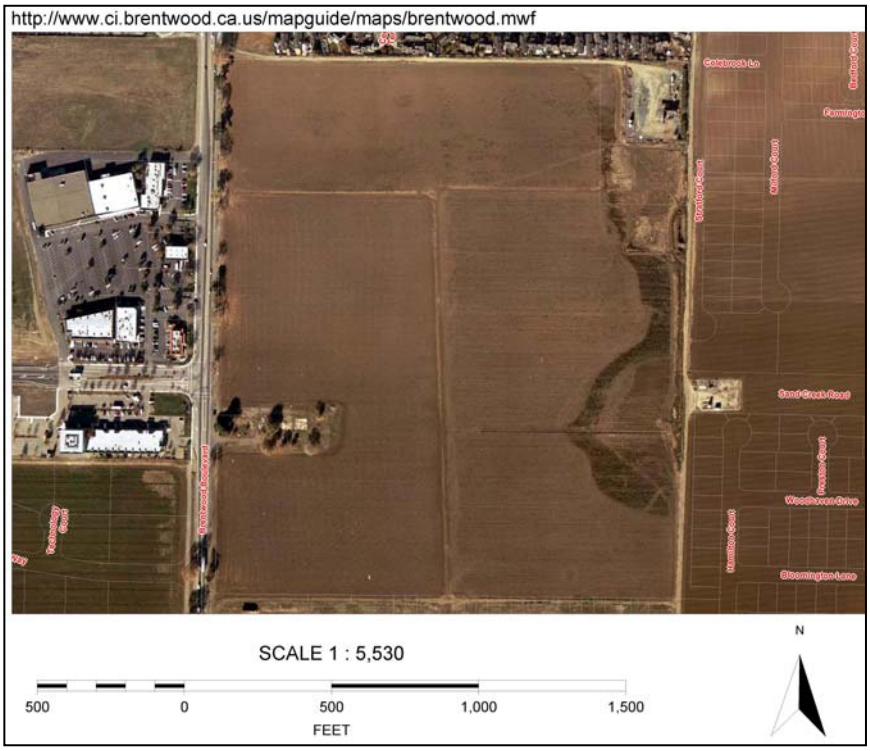


FIGURE 2: AERIAL PHOTO FROM 1999 FROM THE CITY OF BRENTWOOD'S MAP ROOM (HTTP://WWW.CI.BRENTWOOD.CA.US/MAPGUIDE/CCSINDEX.CFM).

The area south of the Sand Creek Road extension was covered with low-lying non-native grasses; and east-west oriented furrows were still present from past cultivation of the property. The soil visibility in this area was reduced to about 20% due to the vegetation. The soil across the parcel was a medium brown sandy clay loam containing numerous small rocks. The surveyors also observed small pieces of black plastic, as well as modern debris including PVC pipe, plastic, bottle glass and one small, square building tile. A fenced off natural gas well was also present along the eastern project area, towards the north end.

FIGURE 3: LOOKING SOUTHEAST ACROSS NORTHERN HALF OF PROJECT AREA.

The 1978 quadrangle map indicates that at that time the area north of the Sand Creek Road extension was an orchard; but the presence of furrows indicate that in recent years the land was cultivated in a field crop. The furrows observed south of the road extension indicate that a field crop was cultivated in that area as well. The aerial photo from 1999 (Figure 2) shows that during that time the project area contained field crops that no longer exist today.

There is also a location south of the Sand Creek Road extension and east of Brentwood Boulevard that contains three concrete slab foundations, a

few walnuts, fruit and other types of trees and some scattered domestic debris. This material occurs across an area measuring approximately 450 feet east-west by 175 feet north-south. It appears that there were three structures present at this location as early as 1968 (USGS Brentwood quadrangle map), but their original construction date is unknown. As indicated by the aerial photos from the City of Brentwood's Map Room, the structures were removed by 2002. The foundations were photographed and measured so that a Primary site record form could be prepared.

FIGURE 4: LOOKING WEST AT AREA WHERE FOUNDATIONS ARE LOCATED.

The westernmost foundation included a rectangular pad with a square patio and a cement circular walkway that appears to be from a former residence. The vegetation was a bit overgrown, which made defining the edges of the concrete quite difficult. The rectangular portion measures 54 'east-west by 17' north-souths. The patio consists of several 4x4' square concrete sections and measures 25 'east-west by 28' north to south. The cement walkway runs from the south side of the patio and curves around to the east side. The other two foundations appear to have been from outbuildings. The one east of the former residence measures 34' east-west by 24' north to south and has a concrete slab foundation (containing) some minimal rebar that was observed in the concrete. Given its shape the foundation may have been from a garage. The other foundation is located immediately to the north and east of the suspected former garage. That foundation measures 42' east-west by 40' north to south and has a perimeter foundation with a poured concrete slab.

Additionally, some domestic type materials were observed around these foundations, including a rusted bicycle, a bike tire, a corrugated metal sheet, metal equipment parts, utensils, one tile, plastic, a few articles of clothing, a bed frame, pane glass, bottle glass and a chain-link gate.

No prehistoric resources, either sites or isolated artifactual materials, were observed during the survey.

CONCLUSIONS

The archival review confirmed that there is a small potential that archaeological materials might be found during construction, particularly in deeply buried native alluvial soil deposits that are likely to be uncovered during earth disturbing activities for utility corridors or sewage systems. Buried archaeological materials may be found in deep excavation below the artificial fill pads necessary for modern residential and/or commercial construction projects. The majority (if not all) of the reviewed reports were negative in that neither historic nor archaeological resources were identified. Archaeological researchers generally agree and suspect that prehistoric cultural material such as artifacts or mortuary features might be encountered during excavation especially along the former channels of main streams and watercourses that once were present in the general area (such as Marsh Creek approximately one-half mile to the north and west across Brentwood Blvd/Highway 4).

Researchers have recommended that caution be taken during construction; in particular that an archaeological monitoring program should be implemented to minimize potential adverse effect, especially in those locations (that may be under development applications) that are in close proximity to places where isolated prehistoric artifacts have been identified previously.

No prehistoric resources were observed. In regards the negative results of other similar archaeological surveys that have been conducted in the project area's vicinity, ARS concluded that implementation of an archaeological monitoring program is not necessary during future earth disturbing activities. Three concrete slab foundations from buildings that were likely greater than 45 years of age were observed in one area. as well as some walnut, fruit and other trees, and domestic material. Based on the layout of the foundations and the associated debris, the structures appear to be remnants of a residence, possibly a garage and second outbuilding that likely date from the 1940s.

However, since they are likely greater than 45 years of age they were evaluated using criteria established in the California Environmental Quality Act (CEQA) (14 CCR 15064.5 and PRC 21084.1).These features do not appear to meet the criteria to be considered significant historic resources and do not appear eligible for listing on the California Register of Historic Resources. The foundations are not likely associated with events that have made a significant contribution to the broad patterns of our State or local history (CRHR, Criterion 1). Although the history of the structures and its past occupants were not researched as part of this project, it is unlikely that they were associated with the lives of persons important in our past (CRHR, Criterion 2). Additionally, they do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possesses high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (CRHR, Criterion 3); nor have they yielded, or may be likely to yield, information important in history (CRHR, Criterion 4).

In addition to having to meet at least one of the four criteria listed above, buildings, sites, structures, objects, and districts representative of California and United States history, architecture, archaeology, engineering, and culture convey significance when they also possess integrity of location, design, setting, materials, workmanship, feeling, and association. While the existing foundations on the Sciortino Ranch project area do appear to retain integrity of location, they have lost all other elements of integrity. Overall the resource does not retain the necessary integrity to convey significant information about the past.

While the foundations and associated materials do not appear to qualify as a significant cultural resource, since they are greater than 45 years of age and are likely to be removed as part of this project they were recorded on Department of Parks and Recreation (DPR) forms to document the past use of the property. The Primary Record form is appended to this document and will be sent to the CHRIS for formal designation.

RECOMMENDATIONS

No potentially significant cultural resources were found within the project area and no further recommendations are warranted at this time. However caution should be exercised in the event that archaeological features, such as concentrations of artifacts or culturally modified soil deposits or features including trash pits older than fifty years of age, are discovered at any time during earth disturbing activities. If a discovery occurs all work should be halted in the vicinity of the find and a qualified archaeologist should be contacted immediately to make an evaluation to assess possible historic importance or prehistoric significance. If warranted by the discovery of a concentration of artifacts or soil deposits, further work in the discovery area should be monitored by an archaeologist.

Artifacts that are typically found associated with prehistoric sites include humanly modified stone, shell, bone or other cultural materials such as charcoal, ash and burned rock indicative of food procurement or processing activities. Prehistoric domestic features include hearths, firepits, or house floor depressions whereas typical mortuary features are represented by human skeletal remains. Historic artifacts potentially include all by-products of human land use greater than 50 years of age.

If human remains are encountered, all work must stop in the immediate vicinity of the discovered remains and the County Coroner must be notified immediately. If the Coroner determines the remains to be that of a prehistoric Native American they will notify the Native American Heritage Commission in Sacramento who is responsible for designating a "Most Likely Descendant" of the remains. A qualified archaeologist should be notified immediately as well so that an evaluation of the remains and the site can be performed.

The records search indicates that most if not all of the adjacent properties in the general area have, when proposed for development, been evaluated, either through a Record (literature) search and if deemed to have

archaeological sensitivity, then by an actual archaeological inspection. The survey usually is conducted before construction is allowed to begin in earnest. As an example William Self (2004) made the following standard recommendation in his report on the Barrington project area that lies in close proximity to the Sciortino Ranch project:

> *In accordance with CEQA subsection 15064.5(f), should any previously unknown historic or prehistoric resources, including but not limited to charcoal, obsidian or chert flakes, grinding bowls, shell fragments, bone, pockets of dark, friable soils, glass, metal, ceramics, wood or similar debris, be discovered during grading, trenching or other on-site excavation(s), earthwork within 100 feet of these materials shall be stopped until a professional archaeologist certified by the Registry of Professional Archaeologists (RPA) has had an opportunity to evaluate the significance of the find and suggest appropriate mitigation(s), as determined necessary* (2004: 3).

ARS has noticed that none of the parcels on the east side of Brentwood Boulevard were specifically listed as being subject to Visual Inspection, as was recommended in the Historical and Cultural Resources chapter of the April 2008 Specific Plan. However several parcels nearer to Marsh Creek and located to the west of the Boulevard were specifically recommended to be evaluated if later a development application were submitted to the City. To address the potential that possibly significant (unique) archaeological materials or historic structures requiring special analysis might be later discovered, the Specific Plan EIR provided specific procedures and policies.

For instance in the event that isolated or sporadic prehistoric cultural materials are discovered on the Sciortino Ranch property, the location of the discovery should be inspected by an archaeologist. If the discovery appears to be an isolated find, monitoring of excavation in the vicinity would be appropriate to confirm this. However if the discovery appears indicative of a more complex deposit, archaeological investigation should be undertaken. A limited subsurface test procedure (auger test) should be performed in the discovery location to determine if any culturally modified soils or more concentrated artifactual remains are present at greater depths.

If concentrated prehistoric cultural materials are discovered during construction (trenching for utilities etc.), ARS recommends that work in the vicinity of the discovery be halted until the discovered cultural materials can be evaluated. To satisfy CEQA guidelines it may be necessary that further investigations be conducted to assess the scientific importance and cultural value of the discovered material.

In the case when human skeletal remains are discovered, the construction must be stopped near the discovery so that the required notification of the County Coroner can occur; the coroner must be advised about the location and context of the discovery. Once it is determined that the remains are Native American origin the coroner's office also will make the necessary consultation with the Native American Heritage Commission (NAHC), which has the responsibility to determine the appropriate Native American tribal group(s) from whom the designated "Most Likely Descendant" (MLD) will be chosen. Upon notification the MLD will also be given the opportunity to personally examine the discovery location, to evaluate the discovery location, and then provide comments about the further disposition and treatment of the (assumed) prehistoric human remains.

The following are the standard archaeological monitoring and spot check procedures that are used by ARS. In the event that artifacts or features are found during the earth disturbing phase of construction, these procedures should be implemented in the vicinity of the discovery, following an investigation that determines that potentially significant discoveries have been made.

MONITORING AND SPOT CHECK PROCEDURES

- Monitoring will consist of directly watching the major excavation process. Monitoring will occur during the entire work day, and will continue on a daily basis until a depth of excavation has been reached at which resources could not occur. This depth is estimated as usually about five feet below grade at the beginning of the project, but may require modification in specific cases, and will be determined by the monitoring archaeologist based on observed soil conditions. Spot checks will consist of partial monitoring of the progress of excavation over the course of the project. During spot checks, all spoils material, open excavations, recently grubbed areas, and other soil disturbances will be inspected to determine if cultural materials are present. The frequency and duration of spot checks will be based

on the relative sensitivity of the exposed soils and active work areas. The monitoring archaeologist will determine the relative sensitivity of the parcel.

- If prehistoric human interments (human burials or skeletal remains) are encountered within the native soils of the parcel, all work should be halted in the immediate vicinity of the find. The County Coroner, project superintendent, and the Agency Liaison should be contacted immediately. The procedures to be followed at this point are prescribed by law.
- If significant cultural deposits other than human burials are encountered, the project should be modified to allow the artifacts or features to be left in place, or the archaeological consultant should undertake the recovery of the deposit or feature. Significant cultural deposits are defined as archaeological features or artifacts that associate with the prehistoric period, the historic era (Mission and Pueblo Periods), and the American era up to about 1950.
- Whenever the monitoring archaeologist suspects that potentially significant cultural remains or human burials have been encountered, the piece of equipment that encounters the suspected deposit will be stopped, and the excavation inspected by the monitoring archaeologist. If the suspected remains prove to be non-significant or non-cultural in origin, work will recommence immediately.

  If the suspected remains prove to be part of a significant deposit, all work should be halted in that location until appropriate recordation and (possible) removal has been accomplished. If human remains (burials) are found the County Coroner must be contacted to evaluate the discovery area and determine the context; not all discovered human remains reflect Native American origins. However in all cases where prehistoric or historic era Native American resources are involved, the Native American Heritage Commission should be contacted to designate appropriate representatives of the local Native American community, who also should be contacted about their concerns.
- Equipment stoppages will only involve those pieces of equipment that have actually encountered significant or potentially significant deposits, and should not be construed to mean a stoppage of all equipment on the site unless the cultural deposit covers the entire building site.
- During temporary equipment stoppages brought about to examine suspected remains, the archaeologist should accomplish the necessary tasks with all due speed.

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Archaeological Consulting and Research Services, Inc.

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Ashkar, S. (Jones & Stokes Associates)

1998a Primary site record form on BEIR- 1, or the secondary clarifier associated with the Brentwood Wastewater Treatment Plant; original facility dates from the 1940's. Site recorded 3/08/98. (See Report S-20808 by Jones & Stokes Associates (1998c).

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Shoup, Laurence (Archaeological/Historical Consultants)
2006 General Inventory Report between Mileposts 50 and 80 maintained by UP (Union Pacific) for Tracy Subdivision. Report prepared 08/10/2006. Cited in Shoup (2007).

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2001 Primary site record form on an isolated find; form is attached to Report #S-24091 (Cultural Resources Evaluation of the Sunset Industrial Park, City of Brentwood prepared by Jones & Stokes, Oakland).

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1996 Class II Archaeological Survey of the Contra Costa Canal, Contra Costa County, California. Unpublished report on file at the NWI of the CHRIS under S-18440.

Wick, Emily (Archaeological Resource Service)
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NATIVE AMERICAN CONTACTS

The following letters were sent to the Native American Heritage Commission and then to the listed individuals and/or groups whose names were supplied by the NAHC as interested local contacts. As of the date of this report no response has been received from any of the contacted individuals. However if a response should be received any comments or information will be appended to this report.

November 25, 2008

Ms. Deborah Pilas-Treadway
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 954814
1-916-657-5390

SENT BY FACSIMILE

Re: ARS Project #08-076, the proposed Sciortino Ranch subdivision, Brentwood Blvd. and Sand Creek Road, Brentwood, Contra Costa County, California

Dear Ms. Pilas-Treadway:

Archaeological Resource Service (ARS) has been retained by New Urban Communities Partners, LLP (NUCP, LLC), to evaluate the property located at on the east side of Brentwood Blvd. at Sand Creek Road in Brentwood, Contra Costa County. The project area consists of approximately 65 acres in seven parcels in which a residential subdivision is proposed to be built. The project area consists of predominately fallow agricultural fields that are surrounded by both residential and commercial developments that have been built in the last ten or fifteen years and is located within the eastern expanding edge of Brentwood city limits. The project area is located along the east side of Brentwood Boulevard and is roughly divided into two segments on either side of the newly expanded eastward section of Sand Creek Road (that extends through the adjacent Barrington subdivision area) to Sellers Avenue. To assist you in locating the project area we attach two figures: Figure 1 is an Aerial photograph of the Sciortino Ranch property and Figure 2 is a diagram of the project area in comparison to the Barrington study area on its eastern side.

The project area lies within the northwest and southwest quarters of Section 7, in Township 1 North, Range 3 East, as shown on the Brentwood (1978) 7.5 minute USGS topographic quadrangle map (attached). The Universal Transverse Mercator Grid Coordinates to the center of the parcel are: 4200600 meters North, 614800 meters East.

Please undertake a review of the Sacred Lands Inventory file for this location and supply us with a list of the appropriate organizations and individuals who we should contact regarding this project. Thank you for your assistance with this project. Should you have any questions regarding this study, please feel free to contact me at 707-762-2573.

Sincerely,

Katherine S. Flynn
Archaeological Resource Service

December 9, 2008

The Ohlone Indian Tribe
Andrew Galvan
P. O. Box 3152
Fremont, CA 94539

Re: ARS Project #08-076, the proposed Sciortino Ranch subdivision, Brentwood Blvd. and Sand Creek Road, Brentwood, Contra Costa County, California

Dear Mr. Galvan:

Archaeological Resource Service (ARS) has been retained by New Urban Communities Partners, LLP (NUCP, LLC), to evaluate the property located at on the east side of Brentwood Blvd. at Sand Creek Road in Brentwood, Contra Costa County. The project area consists of approximately 65 acres in three parcels in which a residential subdivision is proposed to be built. The project area consists of predominately fallow agricultural fields that are surrounded by both residential and commercial developments that have been built in the last ten or fifteen years and is located within the eastern expanding edge of Brentwood city limits. The project area is located along the east side of Brentwood Boulevard and is roughly divided into two segments on either side of the newly expanded eastward section of Sand Creek Road (that extends through the adjacent Barrington subdivision area) to Sellers Avenue. To assist you in locating the project area we attach two figures: Figure 1 is an Aerial photograph of the Sciortino Ranch property and Figure 2 is a diagram of the project area in comparison to the Barrington study area on its eastern side.

The project area lies within the northwest and southwest quarters of Section 7, in Township 1 North, Range 3 East, as shown on the Brentwood (1978) 7.5 minute USGS topographic quadrangle map (attached). The Universal Transverse Mercator Grid Coordinates to the center of the parcel are: 4200600 meters North, 614800 meters East.

Your name has been given to us by the Native American Heritage Commission as one of the appropriate organizations and individuals who we should contact regarding this project. Therefore we would appreciate hearing from you if you or your associates have any information about this project. Thank you for your assistance with this project. Should you have any questions regarding this study, please feel free to contact me at 707-762-2573.

Sincerely,

Katherine S. Flynn
Archaeological Resource Service

Archaeological Resource Service

December 9, 2008

Katherine Erolinda Perez
P. O. Box 717
Linden, CA 95236

Re: ARS Project #08-076, the proposed Sciortino Ranch subdivision, Brentwood Blvd. and Sand Creek Road, Brentwood, Contra Costa County, California

Dear Ms. Perez:

Archaeological Resource Service (ARS) has been retained by New Urban Communities Partners, LLP (NUCP, LLC), to evaluate the property located at on the east side of Brentwood Blvd. at Sand Creek Road in Brentwood, Contra Costa County. The project area consists of approximately 65 acres in three parcels in which a residential subdivision is proposed to be built. The project area consists of predominately fallow agricultural fields that are surrounded by both residential and commercial developments that have been built in the last ten or fifteen years and is located within the eastern expanding edge of Brentwood city limits. The project area is located along the east side of Brentwood Boulevard and is roughly divided into two segments on either side of the newly expanded eastward section of Sand Creek Road (that extends through the adjacent Barrington subdivision area) to Sellers Avenue. To assist you in locating the project area we attach two figures: Figure 1 is an Aerial photograph of the Sciortino Ranch property and Figure 2 is a diagram of the project area in comparison to the Barrington study area on its eastern side.

The project area lies within the northwest and southwest quarters of Section 7, in Township 1 North, Range 3 East, as shown on the Brentwood (1978) 7.5 minute USGS topographic quadrangle map (attached). The Universal Transverse Mercator Grid Coordinates to the center of the parcel are: 4200600 meters North, 614800 meters East.

Your name has been given to us by the Native American Heritage Commission as one of the appropriate organizations and individuals who we should contact regarding this project. Therefore we would appreciate hearing from you if you or your associates have any information about this project. Thank you for your assistance with this project. Should you have any questions regarding this study, please feel free to contact me at 707-762-2573.

Sincerely,

Katherine S. Flynn
Archaeological Resource Service

December 9, 2008

Trina Marine Ruano Family
Ramona Garibay, Representative
16010 Halmar Lane
Lathrop, CA 95330

Re: ARS Project #08-076, the proposed Sciortino Ranch subdivision, Brentwood Blvd. and Sand Creek Road, Brentwood, Contra Costa County, California

Dear Ms. Garibay:

Archaeological Resource Service (ARS) has been retained by New Urban Communities Partners, LLP (NUCP, LLC), to evaluate the property located at on the east side of Brentwood Blvd. at Sand Creek Road in Brentwood, Contra Costa County. The project area consists of approximately 65 acres in three parcels in which a residential subdivision is proposed to be built. The project area consists of predominately fallow agricultural fields that are surrounded by both residential and commercial developments that have been built in the last ten or fifteen years and is located within the eastern expanding edge of Brentwood city limits. The project area is located along the east side of Brentwood Boulevard and is roughly divided into two segments on either side of the newly expanded eastward section of Sand Creek Road (that extends through the adjacent Barrington subdivision area) to Sellers Avenue. To assist you in locating the project area we attach two figures: Figure 1 is an Aerial photograph of the Sciortino Ranch property and Figure 2 is a diagram of the project area in comparison to the Barrington study area on its eastern side.

The project area lies within the northwest and southwest quarters of Section 7, in Township 1 North, Range 3 East, as shown on the Brentwood (1978) 7.5 minute USGS topographic quadrangle map (attached). The Universal Transverse Mercator Grid Coordinates to the center of the parcel are: 4200600 meters North, 614800 meters East.

Your name has been given to us by the Native American Heritage Commission as one of the appropriate organizations and individuals who we should contact regarding this project. Therefore we would appreciate hearing from you if you or your associates have any information about this project. Thank you for your assistance with this project. Should you have any questions regarding this study, please feel free to contact me at 707-762-2573.

Sincerely,

Katherine S. Flynn
Archaeological Resource Service

ARS version of
State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Page: 1 of 3

Supplemental: ☐

Primary #: P-07-
HRI #:
Trinomial:
NRHP Status Code:

Other Listings: ARS 08-076-01
Review Code: **Reviewer:** **Date:**
Resource Name or #: ARS 08-076-01

P1. Other Identifier: Foundations at 7480 Brentwood Blvd.
P2. Location: ☐ Not for Publication ☑ Unrestricted
a. County: Contra Costa and (P2b and P2c or P2d. Attach a Location Map as necessary.)
b. USGS Quad: Brentwood 7.5' **Date** 1978 **T** 1N **R** 3E 1/4 of 1/4 of Section: un Mt. Diablo **B.M.**
c. Address: 7480 Brentwood Blvd.
City: Brentwood **Zip:** 95413
d. UTM: Zone: 10 , 614700 **mE** / 4200460 **mN**
e. Other Locational Data: southeast corner of Brentwood Blvd. and Sand Creek Road extension within APNs 016170011 and part of -012

Land Grant: Los Meganos

P3. Description: The site includes three concrete slab foundations, five walnut trees, one fruit (possibly apricot) tree, a few landscaping type trees and some scattered domestic debris. These items occur across an area measuring approximately 450 feet east-west by 175 feet north-south. It appears that there were three structures present at this location as early as 1968 (USGS Brentwood quadrangle map), but their original construction date is unknown. According to the 1914 USGS Brentwood quadrangle map they were not present at that time. As indicated by the aerial photos from the City of Brentwood's Map Room, the structures were removed by 2002. The westernmost foundation includes a rectangular pad with a square patio and a cement circular walkway that looks to be from a former residence. The vegetation is overgrown, which made it difficult to define the edges of the concrete pad. The rectangular portion measures 54' (e/w) by 17' (n/s). The patio consists of several 4x4' square concrete sections and measures 25' (e/w) by 28' (n/s). The cement walkway runs from the south side of the patio and curves around to the east side. The other two foundations appear to have been from outbuildings. The one east of the former residence measures 34' (e/w) by 24' (n/s) and has a concrete slab foundation with rebar observed at one spot in the concrete. Given its shape the foundation may have been from a garage. The other foundation is located immediately to the north and east of the suspected former garage. That foundation measures 42' (e/w) by 40' (n/s) and has a perimeter foundation with a poured concrete slab.

The domestic type materials observed near these foundations included a rusted bicycle, a bike tire, a corrugated metal sheet, small metal equipment parts, utensils, one tile, plastic, a few articles of clothing, a bed frame, pane glass, bottle glass and a chain-link gate.

P3b. Resource Attributes - Historic: AH2. Foundations/structure pads
P3c. Resource Attributes - Prehistoric:
P4. Resources Present: ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☑ Other (Isolates, etc)

P5. Photograph or Drawing:

P5b. Description of Photo:
Looking east. Foundation in forground is of suspected former residence.

P6. Date Constructed/Age:
Historic

P7. Owner and Address:
New Urban Community Partners
333 Civic Center Drive
Pleasant Hill, CA 94523

P8. Recorded by:
Sally Evans, Archaeological Resource Service, 122 American Alley, Suite A, Petaluma, CA 94952

P9. Date Recorded:
04-Dec-08

P10. Type of Survey:
Reconnaissance
Describe Survey:
Transects

P11. Report Citation: Flynn, Katherine (2008): The Results of a Record Search and Archaeological Survey of the Sciortino Project, Brentwood Blvd. at Sand Creek Road, Brentwood, Contra Costa County, CA. (ARS 08-076a & b).

Attachments: ☐ None ☑ Location Map ☑ Sketch Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Stone Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Isolate Record ☐ Other:

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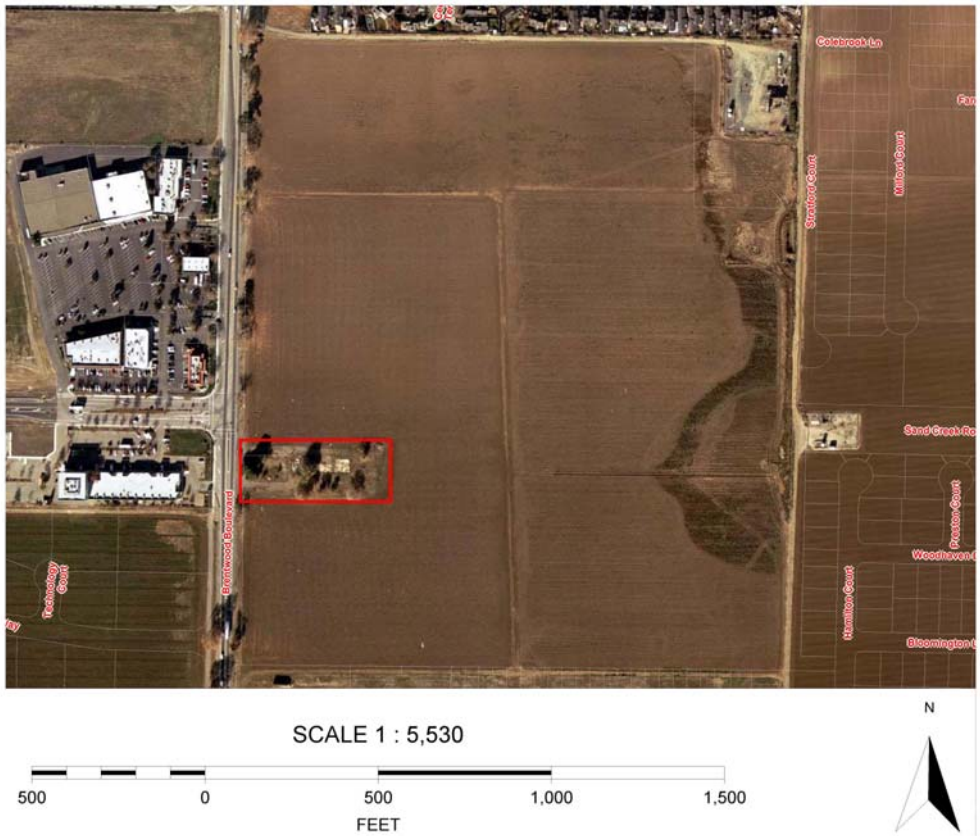
DEPARTMENT OF PARKS AND RECREATION

Primary #: P-07-
HRI #:
Trinomial:

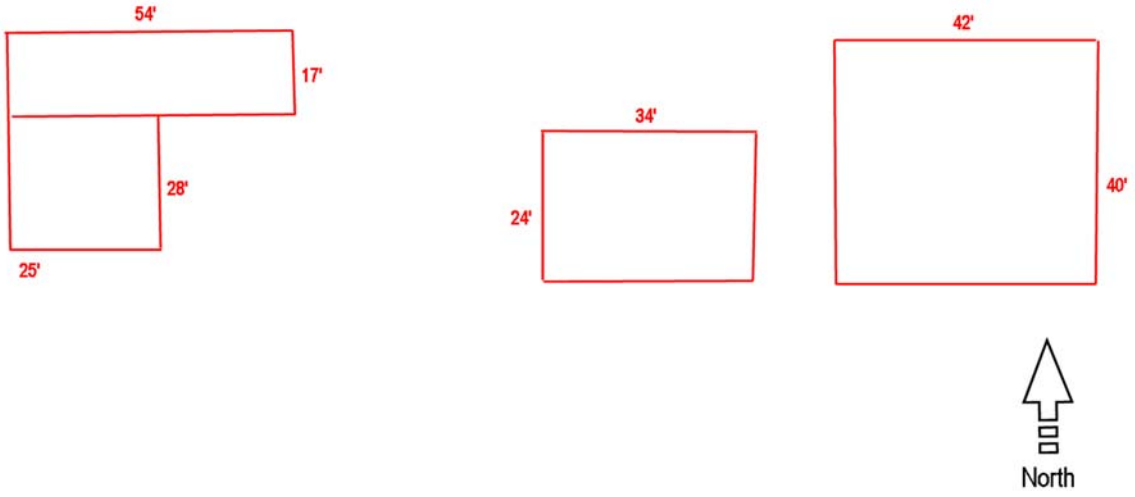
SKETCH MAP

Page: 2 of 3 **Resource Name or #:** ARS 08-076-01

Drawn by: S. Evans using City of Brentwood Map Room GIS data (1999 aerial) **Sketch Date:** 04-Dec-08



Foundation measurements and layout within the red squared-off portion shown on the 1999 aerial above



ARS version of

State of California - The Resources Agency

DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #: P-07-

HRI #:

Trinomial:

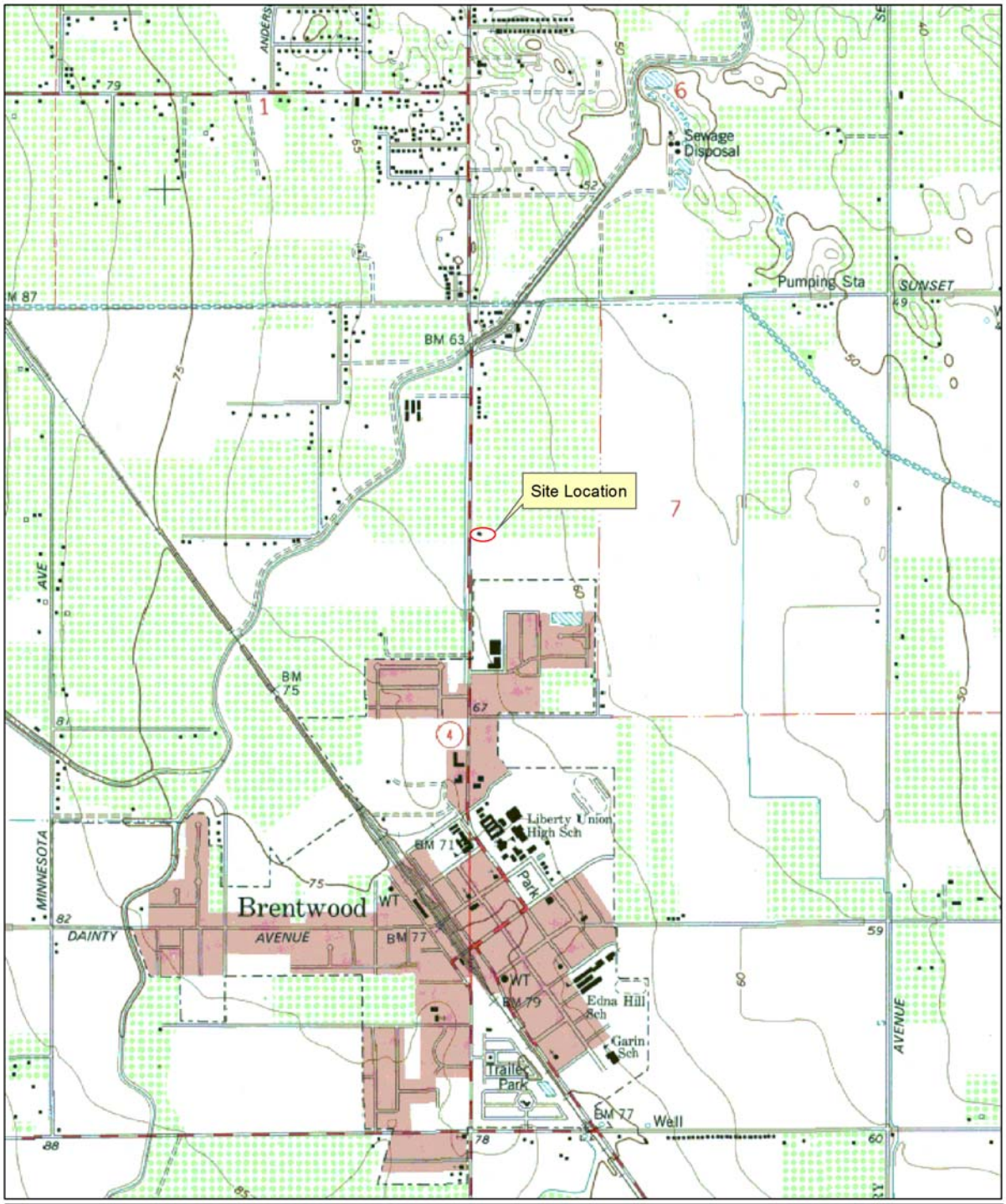
Page: 3 of 3

Resource Name or #: ARS 08-076-01

Map Name: USGS 7.5' Brentwood Quadrangle

Scale: 1:24000

Map Date: 1978



Archaeological Resource Service

ARS 08-076: Sciortino Ranch Subdivision (APNs 016-170-011, -012, -013)
Brentwood Boulevard, Brentwood, Contra Costa Co.

USGS 7.5' Brentwood Quadrangle Map (1978)

0 0.25 0.5 1 1.5 Miles

Site Location Map

APPENDIX J

September 20, 2007

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

Brentwood Boulevard and Sand Creek Road
APNs 016-170-011 and -012
Brentwood, California 94513

AEI Project No. 274250

Prepared For

New Urban Communities/Sciortino, LLC
New Urban Communities, LLC
C/O Thomas Properties,
3100 Oak Road, Suite 140
Walnut Creek, California 94597

Prepared By

AEI CONSULTANTS
2500 Camino Diablo
Walnut Creek, California 94597
925-944-2899

AEI

EXECUTIVE SUMMARY

AEI Consultants (AEI) was retained by New Urban Communities/Sciortino LLC to conduct a Phase I Environmental Site Assessment (ESA), in conformance with the scope and limitations of ASTM Standard Practice E1527-05 and the Environmental Protection Agency Standards and Practices for All Appropriate Inquiries (40 CFR Part 312) for the property located at Brentwood Boulevard and Sand Creek Road, APNs 016-170-011 and -012 in the City of Brentwood, Contra Costa County, California. Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report.

Property Description

The subject property is located on the east side of Brentwood Boulevard at Sand Creek Road in a mixed agricultural, residential, and commercial area of Brentwood. The property totals approximately 61.48 acres and consists of an irregularly shaped parcel of vacant land formerly used for agricultural purposes. The property is divided into three (3) parcels, labeled on the most current A.L.T.A Land Title Survey as parcel 1, parcel 2, and parcel 3. Parcel 3 (19.49 acres) occupies the northern portion of the subject property and is a portion of the APN 016-170-012. Parcel 1 (37.71 acres) occupies the majority of the southern portion of the subject property and is identified with the APN 016-170-011 and a portion of 016-170-012. Parcel 2 (4.28 acres) occupies a strip of land on the southern portion of the subject property and is identified with portion of 016-170-012. What appears to be the initial stage of a road appears in the center of the subject property, running from east to west. This road development is inferred to be a continuation of Sand Creek Road. A natural gas production well is located at the east side of the subject property. According to a representative of the owner of the subject property, Mr. Steve Thomas, the natural gas well is currently active. Residences and farming structures existed formerly on the west side of the subject property along Brentwood Boulevard. The concrete pads associated with these former buildings remain in place. AEI understands that the property is intended for residential and mixed-use development.

According to historical sources and a review of previous environmental reports conducted for the subject property, the lot was used for the cultivation of orchards (peaches, almonds, pecan and apricots) from at least the 1950s to the early 2000s. The west side of the subject property was developed with a residence and associated structures (barns and/or sheds) from at least 1939 to the late 1990s. A fire destroyed many of the buildings in the late 1980s. Between the 1980s to early 2000s the subject property was used for the cultivation of tomatoes and corn.

The immediately surrounding properties consist of residences to the north, an approximately 100 foot by 200 foot strip of vacant land followed by a fenced-off area of vacant land and a natural gas pumping facility to the northeast, vacant land currently undergoing the preliminary stages of development to the east, residences and commercial retail buildings to the south, and Brentwood Boulevard followed by Sand Creek Plaza, Sand Creek Road, and Brentwood Center to the east.

Based upon topographic map interpretation and site observations, the direction of groundwater flow beneath the subject property is inferred to be to the northwest. Based on information obtained from a groundwater monitoring report conducted at a nearby site, the depth to

groundwater in the vicinity of the subject property is expected to be encountered at approximately 20 feet below ground surface (bgs).

Findings

Recognized environmental conditions (RECs) are defined by the ASTM Standard Practice E1527-05 as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. AEI's investigation has revealed the following recognized environmental conditions associated with the subject property or nearby properties:

- No on-site recognized environmental conditions were identified during the course of this investigation.

Historical recognized environmental conditions (HRECs) are defined by the ASTM Standard Practice E1527-05 as an environmental condition which in the past would have been considered a recognized environmental condition, but which may or may not be considered a recognized environmental condition currently. AEI's investigation has revealed the following historical recognized environmental conditions associated with the subject property or nearby properties:

- No on-site historical recognized environmental conditions were identified during the course of this investigation.

Environmental issues include environmental concerns identified by AEI that warrant discussion but do not qualify as recognized environmental conditions, as defined by the ASTM Standard Practice E1527-05. AEI's investigation has revealed the following environmental issues associated with the subject property or nearby properties:

- An interview was conducted with Mrs. Rosemary Sciortino during a previous Phase I Environmental Site Assessment update performed for the subject property. Mrs. Sciortino was identified in the report as the property owner at the time, who had occupied the subject property for several decades. According to Mrs. Sciortino, the subject property was equipped with two underground storage tanks (USTs) and two associated fuel dispensers from at least the 1950s to the late 1990s or early 2000s. These USTs were located north of the former residence and associated farming structure, at the west side of the subject property. Mrs. Sciortino did not know when the tanks were installed and whether the USTs were ever removed. No files pertaining to the USTs and or their removal were found at the agencies that were contacted or visited during this investigation. On November 3, 2005, AEI performed a geophysical survey at the site. The area was initially swept over using a reflective induction scan to identify anomalies within the subsurface. The locations of any anomalies were flagged, and these identified areas were swept over again using a magnetometer to identify any shallow metallic anomalies in the subsurface. Subsequent hand auger borings and direct push borings of suspicious areas did not uncover evidence of USTs. A total of four (4) soil borings and four (4) groundwater samples were collected along

the transect in the probable location of the former USTs. The soil and groundwater samples collected did not contain petroleum hydrocarbons at or above the laboratory detection limits. Based on the laboratory results, it does not appear there has been a significant release. Although their presence could not be confirmed, the USTs may still remain in place. During development, if USTs are encountered, the USTs should be removed under the appropriate permits.

- According to historical sources, the subject property was historically used for agricultural purposes, including the cultivation of row crops and orchard trees. The agricultural nature of use at the subject property presumably involved the application, storage, and/or mixing of pesticides on site. As outlined in the reports "Agricultural Chemical Survey" and "Agricultural Chemical Survey Addendum" dated January 9, and January 27, 2006, respectively. On November 7, and 8, 2005, AEI performed shallow soil sampling activities at the property. Sample results indicate that the pesticides dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDT) were present in the majority of the soil samples collected at low concentrations, ranging from 0.015 milligrams per kilograms (mg/kg) to 0.14 mg/kg and 0.0022 mg/kg to 0.043 mg/kg, respectively. These concentrations are well below the respective Environmental Screening Level (ESL) of 1.6 mg/kg for DDE and DDT. In addition, a-chlordane and g-chlordane were detected in one soil sample; however, the detected concentrations of a-chlordane and g-chlordane (0.020 mg/kg and 0.011 mg/kg, respectively) were well below the ESL for chlordane of 0.44 mg/kg (an ESL for a-chlordane and g-chlordane has not been established).

  Lead and arsenic were also present in the soil samples collected. Lead was present at concentrations ranging from 18 mg/kg to 110 mg/kg, below the ESL for lead of 150 mg/kg, and does not appear to pose a risk to human health or the environment. Arsenic was present at concentrations ranging from 13 mg/kg to 19 mg/kg, above the ESL for arsenic of 5.5 mg/kg. On January 20, 2006, after review of the report by the Contra Costa County Hazardous Materials Programs (CCCHMP) eight (8) discrete soil samples, in addition to eleven (11) of the original samples were reanalyzed for arsenic.

  In light of the planned development of the land for residential purposes, these findings were presented to the CCCHMP for review and concurrence that no further action is necessary with respect to historical pesticide use onsite for residential development to occur. The CCCHMP agreed that historical pesticide use at the site does not pose a threat to human health or the environment and no further action is required for this site.

- An inactive irrigation well was observed at the east side of the subject property. This well is not currently in use and is not planned for future use. Based on the current nature of the well, its presence is not expected to represent a significant environmental concern. However, in accordance with best management practices the well should be properly destroyed under proper agency oversight.

- An inactive water well, inferred to have been used in conjunction with the historical residences onsite, was observed on the western side of the subject property. This well is not currently in use, and based on the current nature of the well its presence is not expected to

represent a significant environmental concern. However, in accordance with best management practices the well should be properly destroyed under proper agency oversight.

- A natural gas production well, identified as Sciortino 1-7, is located along the eastern side of the property. According to Mr. Thomas, the natural gas well is currently active. As part of the investigation of the suspected USTs, AEI collected a shallow soil sample from a boring (SB-13) near this well and the associated small condensate tank. The soil sample was analyzed for petroleum hydrocarbons. Very low concentrations of heavy range hydrocarbons were detected, up to 5.6 mg/kg, well below concentrations of concern or indicating a significant release. Based on these factors, the presence of the natural gas production well is not expected to represent a significant environmental concern. However, AEI understands the subject property is planned for redevelopment for residential and civic use. As such, if the gas production well on the property is to be abandoned, remain idle, or begin producing in the future, the Department of Oil and Gas (DOG) should be contacted for the relevant standards and guidelines.

- An interview was conducted with Mr. Enrico Cinquini during a previous Phase I Environmental Site Assessment Update performed for the subject property. Mr. Cinquini was identified in the report as the previous owner of the subject property. According to Mr. Cinquini, the former onsite residents utilized a septic system. One tank is associated with this system. Since the houses are no longer present, the septic system is currently not in use. The location of the tank is unknown, and no records pertaining to the removal of the tanks were available for review at the local agencies. Septic systems represent an environmental concern due to the potential for these systems to act as conduits to the subsurface of a property. However, historical resources do not indicate the use of significant quantities of hazardous materials (other than pesticides and petroleum products store within on-site USTs) at the residence. Based on this information, the former septic system is not expected to represent a significant environmental concern. However, the septic system may need to be properly abandoned/decommissioned prior to redevelopment.

Conclusions, Opinions, and Recommendations

We have performed a Phase I Environmental Site Assessment for the property located at Brentwood Boulevard and Sand Creek Road, APNs 016-170-011 and -012 in the City of Brentwood, Contra Costa County, California, in conformance with the scope and limitations of ASTM Standard Practice E1527-05 and the Environmental Protection Agency Standards and Practices for All Appropriate Inquiries (40 CFR Part 312). Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property. AEI recommends no further investigations for the subject property at this time.

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1.0 INTRODUCTION

This report documents the methods and findings of the Phase I Environmental Site Assessment (ESA) performed in conformance with the scope and limitations of ASTM Standard Practice E1527-05 and the Environmental Protection Agency Standards and Practices for All Appropriate Inquiries (40 CFR Part 312) for the property located at Brentwood Boulevard and Sand Creek Road, APNs 016-170-011 and -012 in the City of Brentwood, Contra Costa County, California (Figure 1: Site Location Map, Figure 2: Site Map, and Appendix A: Property Photographs).

1.1 Scope of Work

The purpose of the Phase I Environmental Site Assessment is to identify potential environmental liabilities associated with the presence of hazardous materials, their use, storage, and disposal at and in the vicinity of the subject property, as well as regulatory non-compliance that may have occurred at the subject property. Property assessment activities focused on: 1) a review of federal, state, tribal and local databases that identify and describe underground fuel tank sites, leaking underground fuel tank sites, hazardous waste generation sites, and hazardous waste storage and disposal facility sites within the ASTM approximate minimum search distance; 2) a property and surrounding site reconnaissance, and interviews with the past and present owners and current occupants and operators to identify potential environmental contamination; and 3) a review of historical sources to help ascertain previous land use at the site and in the surrounding area.

The goal of AEI Consultants in conducting the environmental site assessment was to identify the presence or likely presence of any hazardous substances or petroleum products on the property that may indicate an existing release, a past release, or a material threat of a release of any hazardous substance or petroleum product into the soil, groundwater, or surface water of the property.

1.2 Significant Assumptions

The following assumptions are made by AEI Consultants in this report. AEI Consultants relied on information derived from secondary sources including governmental agencies, the client, designated representatives of the client, property contact, property owner, property owner representatives, computer databases, and personal interviews. Except as set forth in this report, AEI Consultants has made no independent investigation as to the accuracy and completeness of the information derived from secondary sources including government agencies, the client, designated representatives of the client, property contact, property owner, property owner representatives, computer databases, or personal interviews and has assumed that such information is accurate and complete. AEI Consultants assumes information provided by or obtained from governmental agencies including information obtained from government websites is accurate and complete. Groundwater flow and depth to groundwater, unless otherwise specified by on-site well data, or well data from adjacent sites are assumed based on contours depicted on the United States Geological Survey topographic maps. AEI Consultants assumes

the property has been correctly and accurately identified by the client, designated representative of the client, property contact, property owner, and property owner's representatives.

1.3 Limitations

Property conditions, as well as local, state, tribal and federal regulations can change significantly over time. Therefore, the recommendations and conclusions presented as a result of this study apply strictly to the environmental regulations and property conditions existing at the time the study was performed. Available information has been analyzed using currently accepted assessment techniques and it is believed that the inferences made are reasonably representative of the property. AEI Consultants makes no warranty, expressed or implied, except that the services have been performed in accordance with generally accepted environmental property assessment practices applicable at the time and location of the study.

Considerations identified by ASTM as beyond the scope of a Phase I ESA that may affect business environmental risk at a given property include the following: asbestos-containing materials, radon, lead-based paint, lead in drinking water, wetlands, regulatory compliance, cultural and historic resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality, mold, vapor intrusion, and high voltage lines. These environmental issues or conditions may warrant assessment based on the type of the property transaction; however, they are considered non-scope issues under ASTM Standard Practice E1527-05.

If requested by the client, these non-scope issues are discussed in Section 6.2. Otherwise, the purpose of this investigation is solely to satisfy one of the requirements for qualification of the innocent landowner defense, contiguous property owner or bona fide prospective purchaser under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). ASTM Standard Practice E1527-05 and the EPA Standards and Practices for All Appropriate Inquiries (40 CFR Part 312) constitute the "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in:

1) 42 U.S.C § 9601(35)(B), referenced in the ASTM Standard Practice E1527-05.

2) Sections 101(35)(B) (ii) and (iii) of CERCLA and referenced in the EPA Standards and Practices for All Appropriate Inquiries (40 CFR Part 312).

3) 42 U.S.C. 9601(40) and 42 U.S.C. 9607(q).

The Phase I Environmental Site Assessment is not, and should not be construed as, a warranty or guarantee about the presence or absence of environmental contaminants that may affect the property. Neither is the assessment intended to assure clear title to the property in question. The sole purpose of investigation into property title records is to ascertain a historical basis of prior land use. All findings, conclusions, and recommendations stated in this report are based upon facts, circumstances, and industry-accepted procedures for such services as they existed at the time this report was prepared (i.e., federal, state, and local laws, rules, regulations, market

conditions, economic conditions, political climate, and other applicable matters). All findings, conclusions, and recommendations stated in this report are based on the data and information provided, and observations and conditions that existed on the date and time of the property visit. Responses received from local, state, or federal agencies or other secondary sources of information after the issuance of this report may change certain facts, findings, conclusions, or circumstances to the report. A change in any fact, circumstance, or industry-accepted procedure upon which this report was based may adversely affect the findings, conclusions, and recommendations expressed in this report.

1.4 Data Gap and Data Failure

According to ASTM E1527-05, data gaps occur when the Environmental Professional is unable to obtain information required, despite good faith efforts to gather such information.

Data failure is one type of data gap. According to ASTM E1527-05 "data failure occurs when all of the standard historical sources that are reasonably ascertainable and likely to be useful have been reviewed and yet the objectives have not been met". Pursuant to ASTM Standards, historical sources are required to document property use back to the property's first developed use or back to 1940, whichever is earlier.

The following data gaps were identified during the course of this investigation:

- Due to the lack of physical addresses associated with the subject property, a search of historic city directories was not conducted for the subject property. However, based on the quality of other sources of historical information, including aerial photographs and interviews, this data gap is not expected to alter the findings of this report.

- The earliest historical resource obtained during this investigation was an aerial photograph from 1939 which indicated development of the subject property with structures resembling residences and possibly farming operation facilities on the western portion of the subject property along Brentwood Boulevard, and the remainder of the property as agricultural orchard land. The lack of historical sources for the subject property dating back to first developed use represents historical data source failure. However, it is assumed that prior to 1939 the subject property would have been used for agricultural and residential purposes, if not undeveloped. Based on this notion, this data gap is not expected to significantly alter the findings of this investigation.

1.5 Reliance

This investigation was prepared for the sole use and benefit of New Urban Communities, LLC, New Urban Communities/Sciortino LLC, and MetLife. Neither this report, nor any of the information contained herein shall be used or relied upon for any purpose by any person or entity other than New Urban Communities, LLC, New Urban Communities/Sciortino LLC, or MetLife.

2.0 SITE AND VICINITY DESCRIPTION

2.1 Site Location and Description

The subject property is located on the east side of Brentwood Boulevard at Sand Creek Road in a mixed agricultural, residential, and commercial area of Brentwood. The property totals approximately 61.48 acres and consists of an irregularly shaped parcel of vacant land formerly used for agricultural purposes. The property is divided into three (3) parcels, labeled on the most current A.L.T.A Land Title Survey as parcel 1, parcel 2, and parcel 3. Parcel 3 (19.49 acres) occupies the northern portion of the subject property and is a portion of the APN 016-170-012. Parcel 1 (37.71 acres) occupies the majority of the southern portion of the subject property and is identified with the APN 016-170-011 and a portion of 016-170-012. Parcel 2 (4.28 acres) occupies a strip of land on the southern portion of the subject property and is identified with portion of 016-170-012. What appears to be the initial stage of a road appears in the center of the subject property, running from east to west. This road development is inferred to be a continuation of Sand Creek Road. A natural gas production well is located at the east side of the subject property. According to a representative of the owner of the subject property, Mr. Steve Thomas, the natural gas well is currently active. Residences and farming structures existed formerly on the west side of the subject property along Brentwood Boulevard. The concrete pads associated with these former buildings remain in place. AEI understands that the property is intended for residential and mixed-use development.

Natural gas and electricity in the area of the subject property are provided by Pacific Gas & Electric (PG&E). Potable water and sewage disposal are provided to the area by municipal services. Sewage disposal at the subject property was provided to the former residence by an on-site septic system, which is further discussed in Section 6.1.

Refer to Figure 1: Site Location Map, Figure 2: Site Map, and Appendix A: Property Photographs for site location.

2.2 Site and Vicinity Characteristics

The immediately surrounding properties consist of residences to the north, an approximately 100 foot by 200 foot strip of vacant land followed by a fenced-off area of vacant land and a natural gas pumping facility to the northeast, vacant land currently undergoing the preliminary stages of development to the east, residences and commercial retail buildings to the south, and Brentwood Boulevard followed by Sand Creek Plaza, Sand Creek Road, and Brentwood Center to the east.

2.3 Geology and Hydrogeology

Based on a review of the United States Geologic Survey (USGS) Quaternary Geologic Map of the San Francisco Bay Quadrangle, the area surrounding the subject property is underlain by Holocene alluvium. This material is characterized by light-gray to grayish-brown or yellowish-brown gravel, sand, silt and clay. Textures vary from cobble gravel to clay, mixed or

interbedded laterally and vertically in some places. These materials are generally coarser near upland areas, grading downstream to finer materials.

Based on a review of the USGS Brentwood, California Quadrangle Topographic Map, the subject property is situated approximately 60-65 feet above mean sea level, and the local topography is relatively flat, sloping gently to the west. The nearest surface water is Marsh Creek, located 0.41 mile to the northwest. Based upon topographic map interpretation and site observations, the direction of groundwater flow beneath the subject property is inferred to be to the northwest. Based on information obtained from a groundwater monitoring report conducted at a nearby site, the depth to groundwater in the vicinity of the subject property is expected to be encountered at approximately 20 feet bgs.

3.0 HISTORICAL REVIEW OF SITE AND VICINITY

According to historical sources and a review of previous environmental reports conducted for the subject property, the lot was used for the cultivation of orchards (peaches, almonds, pecan and apricots) from at least the 1950s to the early 2000s. The west side of the subject property was developed with a residence and associated structures (barns and/or sheds) from at least 1939 to the late 1990s. A fire destroyed many of the buildings in the late 1980s. Between the 1980s to early 2000s the subject property was used for the cultivation of tomatoes and corn.

The subject property was historically used for agricultural purposes, including the cultivation of row crops and orchards. The agricultural nature of use at the subject property presumably involved the application, storage, and/or mixing of pesticides at the subject property. Refer to Section 4.2.5 for a further discussion of this issue.

In November 1996, a natural gas production site was constructed at the east side of the subject property and is currently identified by the Department of Oil and Gas (DOG) as "Shut In," which indicates that it is not currently producing. However, according to Mr. Thomas, the natural gas well is currently active. This well is further discussed in Section 3.2.5.

According to Mrs. Rosemary Sciortino, the property owner at the time in which a previous Phase I Environmental Site Assessment Update was conducted who had occupied the subject property for several decades, the subject property was equipped with two underground storage tanks (USTs) and two associated fuel dispensers from at least the 1950s to the late 1990s or early 2000s. These USTs are further discussed in Sections 4.1.4 and 4.2.5.

3.1 Aerial Photograph Review

On August 21, 2007, AEI Consultants reviewed aerial photographs of the subject property and surrounding area. Aerial photographs were reviewed for the following years:

Date: 1939	Date: 1982
Scale: 1" = 555'	Scale: 1" = 670'
Date: 1959	Date: 1993
Scale: 1" = 555'	Scale: 1" = 666'
Date: 1965	Date: 1998
Scale: 1" = 333'	Scale: 1" = 666'

In the 1939 aerial photograph, structural development resembling residences and possibly farming operation facilities appear on the western portion of the subject property along Brentwood Boulevard. The remainder of the property appears as agricultural orchard land. The properties adjacent to the west and south appear as vacant land. The properties adjacent to the north and east appear as agricultural land. Marsh Creek appears to the west. No other significant features were noted.

In the 1959 aerial photograph, the orientation of the structures on the subject property appears to have changed, and indicates two (2) structures which resemble residences, and two (2) structures which are inferred to be associated farming operations facilities. The remainder of the subject property remains relatively unchanged except for a strip of uncultivated land on the northern portion of the lot. The property adjacent to the south appears as agricultural land. The property adjacent to the east appears as mixed vacant and agricultural land. The property adjacent to the north appears developed as agricultural land with several structures, inferred to be residential in nature, on the western portion of the lot along Brentwood Boulevard. No other significant changes were noted.

In the 1965 aerial photograph, the uncultivated strip of land on the northern portion of the lot observed in 1959 appears as agricultural orchard land. The property adjacent to the west appears as agricultural land. The property adjacent to the east appears as undeveloped land. A commercial building appears to the northwest. No other significant changes were noted.

In the 1982 aerial photograph, strips of uncultivated land appear in the middle and on the southern portion of the subject property. Significant residential and commercial development appears to the south, southwest, north, and northwest. Sand Creek Road appears to the west. No other significant changes were noted.

In the 1993 aerial photograph, the onsite orchards are no longer present and appear to have been replaced with smaller crops or uncultivated land. The property adjacent to the north appears developed with the residential structures seen currently. The properties adjacent to the west beyond Brentwood Avenue appear developed as seen currently. A cleared area resembling the current gas production facility, including features which resemble above ground storage tanks (ASTs), appears adjacent to the northeast beyond an approximately 100 foot by 200 foot strip of uncultivated land. An additional cleared area, inferred to be a natural gas pumping station based upon a review of the Department of Oil and Gas (DOG) maps, appears immediately adjacent to the east. No other significant changes were noted.

In the 1998 aerial photograph, what appears to be a dirt road is visible in center of the subject property running from south to north with a “T” junction running to the east. Additional residential development appears to the north and northwest. No other significant changes were noted.

Copies of reviewed aerial photographs are included as Figure 3.

3.2 Regulatory Agencies

Local and state agencies, such as environmental health departments, fire prevention bureaus, and building and planning departments are contacted to identify any current or previous reports of hazardous materials use, storage, and/or unauthorized releases that may have impacted the subject property. In addition, information pertaining to Activity and Use Limitations (AULs), defined as legal or physical restrictions, or limitations on the use of, or access to, a site or facility, is requested. Specifically AULs are comprised of engineering controls (EC) and institutional controls (IC).

Engineering Controls are defined as physical modifications to a site or facility to reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or ground water on the property. *Institutional Controls* are defined as a legal or administrative restriction on the use of, or access to, a site or facility to 1) reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or ground water on the property, or 2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment.

3.2.1 Health Department

On August 20, 2007, the Contra Costa County Environmental Health Services Agency (CCCEHSA) was contacted to review files on the subject property and adjacent sites of concern. Files at the CCCEHSA may contain information regarding hazardous materials storage, as well as information regarding unauthorized releases of petroleum hydrocarbons or other contaminants that may affect the soil or groundwater in the area.

No information indicating current or prior use or storage of hazardous materials, or the existence of AULs was on file for the subject property with the CCCEHSA regarding the subject property.

Regarding the property adjacent to the northeast of the subject property beyond an approximately 100 foot by 200 foot strip of vacant land, identified in the regulatory database as the Marsh Creek #2 Dehydration Station, the CCCEHSA stated via a telephone conference with AEI that a Hazardous Materials Business Plan (HMBP) from 2002 was the only information on file. AEI was informed that the HMBP stated that in 2002, 8 pounds of methane, one (1) steel drum of natural gas condensate, and one (1) 2,000-gallon Above Ground Storage Tank (AST) of triethylene glycol were located on the site. No violations were noted regarding the storage of these materials, and no other files relating to the property were available with the CCCEHSA. Based on the information obtained from the CCCEHSA, this site is not expected to represent a significant environmental concern.

3.2.2 Fire Department

On August 16, 2007, the East Contra Costa County Fire Department (ECCFD) and the Brentwood Fire Department (BFD) were contacted for information on the subject property to identify any evidence of previous or current hazardous material usage.

No information indicating current or prior use or storage of hazardous materials, or the existence of AULs was on file for the subject property with the ECCFD or BFD.

3.2.3 Building Department

On August 17, 2007, the Brentwood Building Department (BBD) and the Contra Costa County Building Department (CCCBD) were contacted for information on the subject property in order to identify historical tenants and property use.

No permit records or any information concerning the subject property were on file at the BBD. According to a representative of the CCCBD, an electrical permit was issued in 1976 for the subject property historical APN 016-170-006. No other information regarding the subject property was on file with the CCCBD.

3.2.4 Planning Department

On August 22, 2007, the Brentwood Planning Department (BPD) was contacted for information on the subject property in order to identify AULs associated with the subject property.

No information indicating the existence of AULs was on file for the subject property with the BPD.

3.2.5 Department of Oil and Gas

Department of Oil and Gas (DOG) maps concerning the subject property and nearby properties were reviewed. DOG maps contain information regarding oil and gas development.

One natural gas production well (Venoco, Inc. "Sciortino" 1-7, 01320338) is located at the east side of the subject property. According to records on file with the DOG, the well was drilled in November 1996 and was actively producing until May of 2007. As of May of 2007, the well is identified as "Shut In," which indicates that it is not currently producing. However, according to Mr. Thomas, the natural gas well is currently active. According to a letter from Marquez Energy LLC, the well is drilled to 8,150 feet deep. The equipment associated with the production of the natural gas, including the petroleum AST and condensate AST, are located on the adjacent site to the northeast of the subject property. This site was previously discussed in Section 3.2.1.

3.3 Sanborn Fire Insurance Maps

Sanborn Fire Insurance maps were developed in the late 1800s and early 1900s for use as an assessment tool for fire insurance rates in urbanized areas. A search was made of the University of California, Berkeley McCone Hall Earth Sciences Library and the Seattle Public Library's online collection of Sanborn Fire Insurance maps on October 25, 2005. Sanborn map coverage was not available for the subject property.

3.4 City Directories

Due to the lack of physical addresses associated with the subject property, a search of historic city directories was not conducted for the subject property.

4.0 INTERVIEWS AND USER PROVIDED INFORMATION

4.1 Interviews

Pursuant to ASTM E1527-05, the following interviews were performed during this investigation in order to obtain information indicating RECs in connection with the subject property.

4.1.1 Interview with Owner

A representative of the subject property owner, Mr. Steve Thomas, was not aware of any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the subject property; any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the subject property; or any notices from a governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products.

4.1.2 Interview with Report User

The report user, Mr. Thomas, is also the representative of the subject property owner. An interview conducted with Mr. Thomas is discussed above.

4.1.3 Interview with Key Site Manager

A representative of the key site manager, Mr. Thomas, is also the representative of the subject property owner. An interview conducted with Mr. Thomas is discussed above.

4.1.4 Past Owners, Operators and Occupants

A previous Phase I Environmental Site Assessment Update, completed by AEI Consultants on April 7, 2006, conducted interviews with Mr. Enrico Cinquini and Mrs. Rosemary Sciortino regarding the subject property. Mr. Cinquini was identified as a previous owner of the subject property, and Mrs. Sciortino was identified as the owner of the subject property at the time. Both Mr. Cinquini and Mrs. Sciortino were not aware of any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the subject property; any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the subject property; or any notices from a governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products.

According the Mr. Cinquini and Mrs. Sciortino, the subject property was used for the cultivation of orchards (peaches, almonds, pecan and apricots) from at least the 1950s to the early 2000s. The west side of the subject property was developed with a residence and associated structures (barns and/or sheds) from at least the 1950s to the late 1990s. A fire destroyed many the buildings in the late 1980s. Between the 1980s to early 2000s the subject property was used for

the cultivation of tomatoes and corn. During the mid 1980s, a natural gas production site (pumping station) was constructed at the northeast corner of the subject property. The subject property no longer includes the pumping station, which is currently identified as the property adjacent to the northeast.

According to Mr. Cinquini, the former residence located on the subject property utilized a septic system. One tank is associated with this system. Since the houses are no longer present, the septic system is currently not in use. The location of the tank is unknown and no records pertaining to the removal of the tanks were available for review at the local agencies. Septic systems represent an environmental concern when present at commercial sites, due to the potential for these systems to act as conduits to the subsurface of a property. However, historical resources do not indicate the use of significant quantities of hazardous materials (other than pesticides and petroleum products store within on-site USTs) at the residence. Based on this information, the former septic system is not expected to represent a significant environmental concern. However, the septic system may need to be properly abandoned/decommissioned prior to redevelopment.

According to Mrs. Sciortino the subject property was equipped with two USTs and two associated fuel dispensers from at least the 1950s to the late 1990s or early 2000s. These were located north of the former residence and associated farming structure, at the west side of the subject property along Brentwood Boulevard. The dates of installation of the USTs are unknown. Mrs. Sciortino did not know whether the USTs were ever removed. The USTs are discussed in Section 4.2.5.

4.1.5 Interview with Others

Information obtained during interviews with local government officials is incorporated into the appropriate segments of this section.

4.2 User Provided Information

User provided information is intended to help identify the possibility of RECs in connection with the subject property. In addition, pursuant to ASTM E1527-05, the User completed the *ASTM User Questionnaire*. Please refer to Appendix C: References for a copy of the questionnaire.

4.2.1 Title Records/Environmental Liens/AULs

The User did not provide any title records, AULs or documentation indicating environmental liens encumbering the subject property or any information regarding previous uses or ownership of the subject property that indicated recognized environmental conditions.

4.2.2 Specialized Knowledge

AEI was not informed by the User of any specialized knowledge or experience related to the subject property or nearby properties.

4.2.3 Valuation Reduction for Environmental Issues

The User did not indicate to AEI any information to suggest that the valuation of the subject property is significantly less than the valuation for comparable properties due to environmental factors.

4.2.4 Commonly Known or Reasonably Ascertainable Information

The User did not inform AEI of any commonly known or reasonably ascertainable information about that the subject property which aided AEI in identifying conditions indicative of a release or threatened release. AEI was informed that the past use of the property was agricultural in nature.

4.2.5 Previous Reports and Other Provided Documentation

No prior reports or relevant documentation in association with the subject property were made available to AEI during the course of this investigation. However, AEI has performed various subsurface investigations and Phase I Environmental Site Assessments on the subject property, the results of which are presented below:

Phase I Environmental Site Assessment (ESA) Update, AEI Consultants (April 7, 2006)

At the time that this previous ESA report was issued the subject property existed much as it does presently, with the exception of the current road development in the center of the lot. Previous subsurface investigation work performed onsite by AEI consultants was summarized in the ESA as follows:

- According to a "Soil & Groundwater Investigation Report" completed by AEI Consultants on December 15, 2005, and an interview performed with Mrs. Sciortino, the current property owner at the time who had occupied the subject property for several decades, the subject property was equipped with two underground storage tanks (USTs) and two associated fuel dispensers from at least the 1950s to the late 1990s or early 2000s. These USTs were located north of the former residence and associated farming structure, at the west side of the subject property. Mrs. Sciortino did not know when the tanks were installed and whether the USTs were ever removed. No files pertaining to the UST and or their removal were found at the agencies that were contacted or visited during this investigation. On November 3, 2005, AEI performed a geophysical survey at the site. The area was initially swept over using a reflective induction scan to identify anomalies within the subsurface. The locations of any anomalies were flagged, and these identified areas were swept over again using a magnetometer to identify any shallow metallic anomalies in the subsurface. Subsequent hand auger borings and direct push borings of suspicious areas did not uncover evidence of USTs. A total of four (4) soil borings and four (4) groundwater samples were collected along the transect in the probable location of the former USTs. The samples collected did not

contain petroleum hydrocarbons at or above the laboratory detection limits. Based on the laboratory results, it does not appear there has been a significant release. Although their presence could not be confirmed, the USTs may still remain in place. During development, if USTs are encountered, the USTs should be removed under the appropriate permits.

- According to historical sources, the subject property was historically used for agricultural purposes, including the cultivation of row crops and orchard trees. The agricultural nature of use at the subject property presumably involved the application, storage, and/or mixing of pesticides on site. As outlined in the reports "Agricultural Chemical Survey" and "Agricultural Chemical Survey Addendum" dated January 9 and January 27, 2006, respectively, on November 7 and 8, 2005, AEI performed shallow soil sampling activities at the property. Soil sampling location were chosen by first diving the property into a grid of 64 evenly spaced square with each square equal to approximately one acre (Figure 4). From each square, one (1) soil sample was collected from the approximately center of the square. Soil samples from four adjacent acre squares were submitted to the laboratory who analyzed them as a composite sample. In addition, three (3) discrete soil samples were collected from around the former farming structure based on the possibility of chemical mixing in that area. Sample results indicate that the pesticides dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDT) are present in the majority of the soil samples collected. DDE and DDT were reported at concentrations ranging from 0.015 milligrams per kilograms (mg/kg) to 0.14 mg/kg and 0.0022 mg/kg to 0.043 mg/kg, respectively. These concentrations are well below the respective Environmental Screening Level (ESL) of 1.6 mg/kg for DDE and DDT. In addition, a-chlordane and g-chlordane were detected in one soil sample (SB-17) however, the detected concentrations of a-chlordane and g-chlordane (0.020 mg/kg and 0.011 mg/kg, respectively) were well below the ESL for chlordane of 0.44 mg/kg (an ESL for a-chlordane and g-chlordane has not been established). The low concentrations of DDE, DDT, a-chlordane, and g-chlordane present in the soil do not appear to pose a risk to human health or the environment.

  Lead and arsenic were also present in the soil samples collected. Lead was present at concentrations ranging from 18 mg/kg to 110 mg/kg, below the ESL for lead of 150 mg/kg, and does not appear to pose a risk to human health or the environment. Arsenic was present at concentrations ranging from 13 mg/kg to 19 mg/kg, above the ESL for arsenic of 5.5 mg/kg. Due to the elevated levels, on January 20, 2006, per a request by the Contra Costa County Hazardous Materials Programs (CCCHMP) eight (8) discrete soil samples, in addition to eleven (11) of the original samples were reanalyzed for arsenic. Arsenic was detected in each of the discrete samples analyzed from 9 to 12 inches bgs at concentrations ranging from 11 milligrams per kilogram (mg/kg) to 20 mg/kg, with an average of 15.9 mg/kg. Arsenic was also detected in each of the discrete samples analyzed from 21 to 24 inches bgs at concentrations ranging from 8.0 mg/kg to 14 mg/kg, with an average of 10.2 mg/kg. Based on the universal presence of arsenic in the soil samples at concentrations deviating less then 4 mg/kg from the average concentration of 15.21 mg/kg, AEI suspects that arsenic is a naturally occurring element in the soil at the subject site, and remediation of the arsenic is not warranted. In addition, naturally occurring arsenic has been documented throughout the bay area at concentrations up to 20 mg/kg.

Based on the very low concentrations of several pesticides detected as compared to the ESLs, their presence is not expected to pose a threat to human health or the environment. The concentrations of lead and arsenic detected are indicative of naturally occurring concentrations and do not indicate that they were present in the pesticides. Although the arsenic exceeds the ESL for residential soil, the concentrations are consistent across the site and are within a range that is commonly identified as naturally occurring in the Bay Area. Based on this, the shallow soils of the site have not been impacted with arsenic by the historical application of pesticides.

In light of the planned development of the land for residential and mixed-use purposes, these findings were presented to the CCCHMP for review and concurrence that no further action is necessary with respect to historical pesticide use onsite for residential development to occur. The CCCHMP agreed that historical pesticide use at the site does not pose a threat to human health or the environment and no further action is required for this site.

Ultimately, the findings and conclusions/recommendations of the previous report coincide similarly with those of the current investigation.

5.0 REVIEW OF REGULATORY AGENCY RECORDS

The following information was obtained through a search of electronically compiled federal, state, county, and city databases provided by Environmental Data Resources, Inc. (EDR). The database search includes regulatory agency lists of known or potential hazardous waste sites, landfills, hazardous waste generators, and disposal facilities in addition to sites under investigation. The information provided in this report was obtained from publicly available sources. The locations of the sites listed in this report are plotted with a geographic information system utilizing geocoding of site addresses. The accuracy of these locations is generally +/- 300 feet. AEI's field representative has attempted to confirm the locations of listings on or adjacent to the subject property. Refer to the radius map (Appendix B: Regulatory Database Review Report) for the locations of the sites in relation to the subject property.

5.1 Records Summary

DATABASE REVIEWED	SUBJECT PROPERTY	ADJACENT PROPERTY
Identification as National Priorities List (NPL) "Superfund" site	No	No
Identification as a Federal Delisted NPL site	No	No
Identification as CERCLIS and/or CERCLIS/NFRAP site	No	No
Identification as hazardous waste handler and/or generator (RCRA-TSD, LG-GEN and/or SM-GEN)	No	No
Identification as RCRA CORRACTS site	No	No
Identification in Federal Institutional Control/Engineering Control Registries	No	N/A
Identification as an Emergency Response Notification Systems (ERNS) site	No	N/A
Identification as Historical State (Historical CalSites SPL/SCL) site	No	No
Identification as an ENVIROSTOR site	No	No
Identification as SLIC Site	No	No
Identification as solid waste landfill (SWLF)	No	No
Identification as HAZNET site	No	No
Identification as registered underground/aboveground storage tanks (UST/AST)	No	No
Identification as leaking underground storage tanks (LUST) site	No	No

DATABASE REVIEWED	SUBJECT PROPERTY	ADJACENT PROPERTY
Identification as a State DEED Restriction site	No	N/A
Identification as a State Voluntary Cleanup Program (VCP) site	No	No
Identification as Federal Land Use/Indian Lands of the U.S. sites	No	No
Identification as State/Tribal Brownfields site	No	No
Other	No	**YES**

The subject property was not identified during the regulatory database search. The property adjacent to the northeast of the subject property beyond an approximately 100 foot by 200 foot strip of vacant land, identified in the regulatory database as Marsh Creek #2 Dehydration station, was identified as a Contra Costa County Site List site, and is further discussed below.

5.2 Contaminant Migration

Migration of petroleum hydrocarbon or volatile organic compound (VOC) contamination is generally via groundwater. Therefore, only those contaminant release sites located hydrologically upgradient relative to the subject property are expected to represent a potential environmental concern to the subject property. Contaminated sites located hydrologically downgradient of the subject property are not expected to represent a potential threat to the groundwater quality beneath the subject property. Sites that are situated hydrologically cross-gradient relative to the subject property are not expected to represent a concern unless close proximity allows for the potential of lateral migration. As discussed in Section 2.3, groundwater in the vicinity of the subject property is assumed to flow to the northwest.

5.3 Record Details

National Priorities List (NPL) is EPA's national listing of contaminated sites targeted for cleanup because they pose a threat to human health and the environment. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) authorizes and requires the EPA to investigate, categorize, and enforce the cleanup of hazardous waste sites on the NPL. An NPL site on or near a particular property may threaten the environmental integrity of the property or affect its marketability.

No sites within a 1-mile radius of the subject property were identified during the NPL database search.

Federal Delisted NPL List consists of sites that no longer require further response actions as determined by the EPA.

No sites within a ½-mile radius of the subject property were identified during the Delisted NPL database search.

CERCLIS and CERCLIS/NFRAP List consists of sites that the EPA has investigated or is presently investigating for release or threatened release of hazardous substances, which may be subject to review in accordance with the terms and conditions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also known as Superfund). Sites listed on the "No Further Remedial Action Planned" (NFRAP) database are sites where, following an initial investigation, no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require federal Superfund or NPL consideration.

No sites within a ½-mile radius of the subject property were identified during the CERCLIS/NFRAP database search.

Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. Information from the RCRA database is divided into three categories: TSD, LG GEN and SM GEN. The TSD category is searched to a 1-mile radius and tracks facilities which treat, store and/or dispose of hazardous waste. LG GEN, or large generators, are facilities that generate more than 1000 kg of hazardous waste per month. SM GEN, or small generators, are facilities that generate between 100 and 1000 kg of hazardous waste per month. The LG-GEN and SM-GEN databases are searched up to a $^1/_8$-mile radius from the subject property.

No sites within a 1-mile radius of the subject property were identified during the RCRA-TSD database search.

One (1) site within a $^1/_8$-mile radius of the subject property was identified during the RCRA (LG- and SM-GEN) database search.

The storage, treatment, disposal and/or generation of hazardous materials at this site is not a significant environmental concern based on the lack of a documented release or factors discussed in prior segments of Section 5.3.

CORRACTS is an EPA-maintained database of Resource Conservation and Recovery Act (RCRA) facilities undergoing "corrective action". A "corrective action order" is issued when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

No sites within a 1-mile radius of the subject property were identified during the CORRACTS database search.

Federal Institutional Control (IC)/Engineering Control (EC) Registries consist of sites with institutional controls (administrative measures such as land use restrictions, deed restrictions and post remediation requirements intended to prevent exposure to contaminants remaining on site), and engineering controls (physical methods to create pathway elimination for regulated substances to enter environmental media or effect human health).

The subject property was not identified in the Federal IC/EC database search.

Emergency Response Notification Systems (ERNS) List is EPA's database of emergency response actions.

The subject property was not identified during the ERNS database search.

Historical California Sites (CalSites) are provided by the California Environmental Protection Agency (EPA), Department of Toxic Substances Control (DTSC) and include state equivalent NPL (SPL) and CERCLIS (SCL) sites. The CalSites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the CalSites database. The database is no longer updated by the state agency and has been replaced by EnviroStor.

No sites within a 1-mile radius of the subject property were identified during the Historical CalSites database search.

ENVIROSTOR is a database maintained by the DTSC Site Mitigation and Brownfields Reuse Program, which identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (NPL); States Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

No sites within a 1-mile radius of the subject property were identified during the Envirostor database search.

SLIC sites are provided by the Regional Water Quality Control Board (RWQCB). This list includes sites that have recorded spills, leaks, investigations, and cleanups.

No sites within a $^{1}/_{8}$-mile radius of the subject property were identified during the SLIC database search.

Solid Waste Landfills (SWLF) is a database generated by the State of California Solid Waste Information System (SWIS), which includes active and inactive landfills and transfer stations within the state maintained by the California Integrated Waste Management Board.

One (1) site within a ½-mile radius of the subject property was identified during the SWLF database search. This site was plotted 2,173 feet northeast (hydrologically cross-gradient) of the subject property. Based on the relative distance from the subject property, and inferred direction of groundwater flow, this site is not expected to represent a significant environmental concern.

HAZNET Sites database consists of data that is extracted from the copies of hazardous waste manifests received each year by the DTSC.

The subject property was not identified during the HAZNET database search.

Underground/Aboveground Storage Tanks (UST/AST) List is a comprehensive listing of registered underground and aboveground storage tanks located within the State of California.

One (1) site within a ¼-mile radius of the subject property was identified during the UST/AST database search. Due to the lack of a documented release or factors discussed in the LUST segment of Section 5.3, the storage of hazardous materials within registered tanks is not a significant environmental concern.

Leaking Underground Storage Tanks (LUST) List is a list produced by the Regional Water Quality Control Board (RWQCB) of known sites with current or former leaking underground storage tanks on the premises.

Three (3) sites within a ½-mile radius of the subject property were identified during the LUST database search. Of these, the closest site was plotted 762 feet south (hydrologically cross to-up gradient) of the subject property. However, based on online map interpretation, this site is actually located approximately 1,200 feet southwest (hydrologically cross-gradient) of the subject property. Based on the relative distance from the subject property, inferred direction of groundwater flow, and/or regulatory status, these three (3) sites are not expected to represent a significant environmental concern.

State Deed Restriction (DEED) List is maintained by the DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) and Hazardous Waste Management Program (HWMP). The SMBRP list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. The HWMP has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

The subject property was not identified during the DEED database search.

State Voluntary Cleanup Program (VCP) Sites are incorporated in the DTSC SMBRPD database which identifies sites that have known contamination, or those properties undergoing voluntary investigation and/or cleanup and which are listed in the VCP program.

No sites within a ½-mile radius of the subject property were identified during the State VCP database search.

Federal Land Use/Indian Lands of the U.S. is a database of areas administered by the Bureau of Indian Affairs which include areas of 640 acres or more. Included in the database are Federally-administered lands within a reservation which may or may not be considered part of the reservation. Hazardous materials use/storage permits, LUSTs and USTs on Indian Lands may also be incorporated in the State database listings.

No sites within a ½-mile radius of the subject property were identified during the Federal Land Use/Indian Lands Use database search.

State/Tribal Brownfields is a database of abandoned or underused industrial and/or commercial properties that are contaminated (or thought to be contaminated) and have an active potential for redevelopment. Various states do not have specific Brownfields programs, and thus the information may also be incorporated in the State database listings.

No sites within a ½-mile radius of the subject property were identified during the Brownfields database search.

Other

As was discussed in Section 3.2.1 of this report, the property adjacent to the northeast of the subject property beyond an approximately 100 foot by 200 foot strip of vacant land, identified in the regulatory database as the Marsh Creek #2 Dehydration Station, was identified as a Contra Costa County Site List site. The CCCEHSA was contacted regarding this site, and stated that a Hazardous Materials Business Plan (HMBP) from 2002 was the only information on file. The HMBP stated that in 2002, 8 pounds of methane, one (1) steel drum of natural gas condensate, and one (1) 2,000-gallon Above Ground Storage Tank (AST) of triethylene glycol were located on the site. No violations were noted regarding the storage of these materials, and no other files relating to the property were available with the CCCEHSA. Based on the information obtained from the CCCEHSA, this site is not expected to represent a significant environmental concern.

6.0 SITE INSPECTION AND RECONNAISSANCE

On August 21, 2007, a site reconnaissance of the subject property and adjacent properties was conducted by Nathan Ferguson of AEI in order to obtain information indicating the likelihood of recognized environmental conditions at the subject property and adjacent properties as specified in ASTM Standard Practice E1527-05 §8.4.2, 8.4.3 and 8.4.4.

6.1 On-Site Observations

Identified Yes	Identified No	Observation
☐	☒	Hazardous Substances and/or Petroleum Products in Connection with Property Use
☐	☒	Aboveground & Underground Hazardous Substance or Petroleum Product Storage Tanks (ASTs / USTs)
☐	☒	Hazardous Substance and Petroleum Product Containers and Unidentified Containers not in Connection with Property Use
☐	☒	Unidentified Substance Containers
☐	☒	Electrical or Mechanical Equipment Likely to Contain Fluids
☐	☒	Interior Stains or Corrosion
☐	☒	Strong, Pungent or Noxious Odors
☐	☒	Pools of Liquid
☐	☒	Drains, Sumps and Clarifiers
☐	☒	Pits, Ponds and Lagoons
☐	☒	Stained Soil or Pavement
☐	☒	Stressed Vegetation
☒	☐	Solid Waste Disposal or Evidence of Fill Materials
☐	☒	Waste Water Discharges
☒	☐	Wells
☒	☐	Septic Systems
☐	☒	Other

The subject property is currently vacant land.

Solid Waste Disposal or Evidence of Fill Materials

A box containing a discarded mattress box spring and other domestic waste was observed on the western perimeter of the subject property. Based on the nature of these materials, their presence is not expected to represent a significant environmental concern.

Wells

One natural gas production well (Venoco, Inc. “Sciortino” 1-7) is located on the east side of the subject property. Refer to Section 3.2.5 for a further discussion of this well.

An inactive irrigation well was observed at the east side of the subject property. This well is not currently is use and is not planned for future use. Based on the current nature of the well, its

presence is not expected to represent a significant environmental concern. However, in accordance with best management practices the well should be properly destroyed under proper agency oversight.

An inactive water well, inferred to have been used in conjunction with the historical residences onsite, was observed on the western side of the subject property. This well is not currently in use, and based on the current nature of the well its presence is not expected to represent a significant environmental concern. However, in accordance with best management practices the well should be properly destroyed under proper agency oversight.

Septic Systems

According to Mr. Cinquini, the former residence utilized a septic system. One tank is associated with this system. The location of the tank is unknown. Refer to Section 4.1.4 for a further discussion of this septic tank.

6.2 Non-ASTM Services

Building Components

No structural development was observed on the subject property.

Asbestos-Containing Building Materials

For buildings constructed prior to 1980, the Code of Federal Regulations (29 CFR 1926.1101) states that all thermal system insulation (boiler insulation, pipe lagging, and related materials) and surface materials must be designated as "presumed asbestos-containing material" (PACM) unless proven otherwise through sampling in accordance with the standards of the Asbestos Hazard Emergency Response Act.

Based on the lack of current structures on site, ACMs are not expected to be present at the subject property.

Lead-Based Paint

Lead-based paint is defined as any paint, varnish, stain, or other applied coating that has 1 mg/cm^2 (or 5,000 ug/g by dry weight) or more of lead. Section 1017 of the Housing and Urban Development Guidelines, Residential Lead-Based Paint Hazard Reduction Act of 1992, otherwise known as "Title X", defines a lead-based paint hazard is "any condition that causes exposure to lead that would result in adverse human health effects" resulting from lead-contaminated dust, bare, lead-contaminated soil, and/or lead-contaminated paint that is deteriorated or present on accessible, friction, or impact surfaces. Therefore, under Title X, intact lead-based paint on most walls and ceilings would not be considered a "hazard", although the paint should be maintained and its condition monitored to ensure that it does not deteriorate and become a hazard. Additionally, Section 1018 of this law directed HUD and EPA to require the disclosure of known information on lead-based paint and lead-based paint hazards before the sale or lease of most housing built before 1978. Most private housing, public housing, Federally owned housing, and housing receiving Federal assistance are affected by this rule.

Based on the lack of current structures on site, Lead-Based Paint (LBP) is not expected to be present at the subject property.

Radon

Radon is a naturally-occurring, odorless, invisible gas. Natural radon levels vary and are closely related to geologic formations. Radon may enter buildings through basement sumps or other openings.

The US EPA has prepared a map to assist National, State, and local organizations to target their resources and to implement radon-resistant building codes. The map divides the country into three Radon Zones, Zone 1 being those areas with the average predicted indoor radon

concentration in residential dwellings exceeding the EPA Action limit of 4.0 picoCuries per Liter (pCi/L). It is important to note that the EPA has found homes with elevated levels of radon in all three zones, and the EPA recommends site specific testing in order to determine radon levels at a specific location. However, the map does give a valuable indication of the propensity of radon gas accumulation in structures.

Radon sampling was not requested as part of this investigation. According to the USEPA, the radon zone level for the area is Zone 2, which has a predicted average indoor screening level between 2 pCi/L and 4 pCi/L, at or below the action level of 4.0 pCi/L set forth by the EPA.

Drinking Water Sources and Lead in Drinking Water

The Contra Costa Water District supplies potable water to the area. The most recent water quality report states that lead levels in the areas water supply were well within standards established by the US EPA. The subject is also currently equipped with an inactive irrigation and inactive water well, which were previously discussed in Section 6.1.

Mold/Indoor Air Quality Issues

Molds are simple, microscopic organisms, which can often be seen in the form of discoloration, frequently green, gray, white, brown or black. When excessive moisture or water accumulates indoors, mold growth will often occur, particularly if the moisture problem remains undiscovered or is not addressed. As such, interior areas of buildings characterized by poor ventilation and high humidity are the most common locations of mold growth. Building materials including drywall, wallpaper, baseboards, wood framing, insulation, and carpeting often play host to such growth. Mold spores primarily cause health problems through the inhalation of mold spores or the toxins they emit when they are present in large numbers. This can occur primarily when there is active mold growth within places where people live or work.

Mold, if present, may or may not visually manifest itself. Neither the individual completing this inspection, nor AEI has any liability for the identification of mold-related concerns except as defined in applicable industry standards. In short, this Phase I ESA should not be construed as a mold survey or inspection.

Based on the lack of current structures on site, mold is not expected to be present at the subject property.

6.3 Adjacent Property Reconnaissance Findings

Identified Yes	Identified No	Observation
☐	☒	Hazardous Substances and/or Petroleum Products in Connection with Property Use
☒	☐	Aboveground & Underground Hazardous Substance or Petroleum Product Storage Tanks (ASTs / USTs)
☐	☒	Hazardous Substance and Petroleum Product Containers and Unidentified Containers not in Connection with Property Use
☒	☐	Unidentified Substance Containers
☒	☐	Electrical or Mechanical Equipment Likely to Contain Fluids
☐	☒	Interior Stains or Corrosion
☐	☒	Strong, Pungent or Noxious Odors
☐	☒	Pool of Liquid
☒	☐	Drains and Sumps
☐	☒	Pits, Ponds and Lagoons
☐	☒	Stained Soil or Pavement
☐	☒	Stressed Vegetation
☐	☒	Solid Waste Disposal or Evidence of Fill Materials
☐	☒	Waste Water Discharges
☐	☒	Wells
☐	☒	Septic Systems
☐	☒	Other

The property adjacent to the northeast of the subject property was identified in the regulatory database as the Marsh Creek #2 Dehydration Station; a natural gas pumping facility. The CCCEHSA was contacted for information regarding this site, which was previously discussed in Section 3.2.1 and 5.3.

Aboveground & Underground Hazardous Substance or Petroleum Product Storage Tanks (ASTs / USTs)

A natural gas pumping stations was observed on the adjacent property to the northeast of the subject property beyond an approximately 100 foot by 200 foot strip of vacant land. Several ASTs associated with the pumping station site were observed on the property. The ASTs were not identified in the regulatory database, and no evidence of a leak or spill from these features was noted in the vicinity. Based on the assessment performed at the adjacent parcel, lack of other documented release identified during agency review, the lack of any other noted violations on file with the CCCEHSA, these ASTs are not expected to represent a significant environmental concern.

Unidentified Substance Containers

One (1) empty overturned 55-gallon drum and one (1) upright 55-gallon drum, both of unknown contents, were observed on the adjacent property to the northeast of the subject property beyond an approximately 100 foot by 200 foot strip of vacant land. No evidence of a leak or spill from

these features was noted within the vicinity. Based on this observation, and the lack of any noted violations on file with the CCCEHSA, the presence of these drums is not expected to represent a significant environmental concern.

Electrical or Mechanical Equipment Likely to Contain Fluids

Toxic polychlorinated biphenyls (PCBs) were commonly used historically in electrical equipment such as transformers, fluorescent lamp ballasts, and capacitors. According to United States EPA regulation 40 CFR, Part 761, there are three categories for classifying such equipment: <50 ppm of PCBs is considered "Non-PCB"; between 50 and 500 ppm is considered "PCB-Contaminated"; and >500 ppm is considered "PCB-Containing". Pursuant to 15 U.S.C. 2605(e)(2)(A), the manufacture, process, or distribution in commerce or use of any polychlorinated biphenyl in any manner other than in a totally enclosed manner was prohibited after January 1, 1977.

Transformers

The management of potential PCB-containing transformers is the responsibility of the local utility or the transformer owner. Actual material samples need to be collected to determine if transformers are PCB-containing.

Several pole-mounted and pad-mounted transformers were observed on the adjacent properties during the site inspection. No spills, staining or leaks were observed on or around the transformers. Based on the good condition of the equipment, the transformers are not expected to represent a significant environmental concern.

Drains and Sumps

Several storm drains were observed at the adjacent properties. No hazardous substances or petroleum products were noted in the vicinity of the drains. Based on the use of the drains solely for storm water runoff, the presence of the drains is not expected to represent a significant environmental concern.

7.0 FINDINGS AND CONCLUSIONS

Findings

Recognized environmental conditions (RECs) are defined by the ASTM Standard Practice E1527-05 as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. AEI's investigation has revealed the following recognized environmental conditions associated with the subject property or nearby properties:

- No on-site recognized environmental conditions were identified during the course of this investigation.

Historical recognized environmental conditions (HRECs) are defined by the ASTM Standard Practice E1527-05 as an environmental condition which in the past would have been considered a recognized environmental condition, but which may or may not be considered a recognized environmental condition currently. AEI's investigation has revealed the following historical recognized environmental conditions associated with the subject property or nearby properties:

- No on-site historical recognized environmental conditions were identified during the course of this investigation.

Environmental issues include environmental concerns identified by AEI that warrant discussion but do not qualify as recognized environmental conditions, as defined by the ASTM Standard Practice E1527-05. AEI's investigation has revealed the following environmental issues associated with the subject property or nearby properties:

- An interview was conducted with Mrs. Rosemary Sciortino during a previous Phase I Environmental Site Assessment update performed for the subject property. Mrs. Sciortino was identified in the report as the property owner at the time, who had occupied the subject property for several decades. According to Mrs. Sciortino, the subject property was equipped with two underground storage tanks (USTs) and two associated fuel dispensers from at least the 1950s to the late 1990s or early 2000s. These USTs were located north of the former residence and associated farming structure, at the west side of the subject property. Mrs. Sciortino did not know when the tanks were installed and whether the USTs were ever removed. No files pertaining to the USTs and or their removal were found at the agencies that were contacted or visited during this investigation. On November 3, 2005, AEI performed a geophysical survey at the site. The area was initially swept over using a reflective induction scan to identify anomalies within the subsurface. The locations of any anomalies were flagged, and these identified areas were swept over again using a magnetometer to identify any shallow metallic anomalies in the subsurface. Subsequent hand auger borings and direct push borings of suspicious areas did not uncover evidence of USTs. A total of four (4) soil borings and four (4) groundwater samples were collected along

the transect in the probable location of the former USTs. The soil and groundwater samples collected did not contain petroleum hydrocarbons at or above the laboratory detection limits. Based on the laboratory results, it does not appear there has been a significant release. Although their presence could not be confirmed, the USTs may still remain in place. During development, if USTs are encountered, the USTs should be removed under the appropriate permits.

- According to historical sources, the subject property was historically used for agricultural purposes, including the cultivation of row crops and orchard trees. The agricultural nature of use at the subject property presumably involved the application, storage, and/or mixing of pesticides on site. As outlined in the reports "Agricultural Chemical Survey" and "Agricultural Chemical Survey Addendum" dated January 9, and January 27, 2006, respectively. On November 7, and 8, 2005, AEI performed shallow soil sampling activities at the property. Sample results indicate that the pesticides dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDT) were present in the majority of the soil samples collected at low concentrations, ranging from 0.015 milligrams per kilograms (mg/kg) to 0.14 mg/kg and 0.0022 mg/kg to 0.043 mg/kg, respectively. These concentrations are well below the respective Environmental Screening Level (ESL) of 1.6 mg/kg for DDE and DDT. In addition, a-chlordane and g-chlordane were detected in one soil sample; however, the detected concentrations of a-chlordane and g-chlordane (0.020 mg/kg and 0.011 mg/kg, respectively) were well below the ESL for chlordane of 0.44 mg/kg (an ESL for a-chlordane and g-chlordane has not been established).

  Lead and arsenic were also present in the soil samples collected. Lead was present at concentrations ranging from 18 mg/kg to 110 mg/kg, below the ESL for lead of 150 mg/kg, and does not appear to pose a risk to human health or the environment. Arsenic was present at concentrations ranging from 13 mg/kg to 19 mg/kg, above the ESL for arsenic of 5.5 mg/kg. On January 20, 2006, after review of the report by the Contra Costa County Hazardous Materials Programs (CCCHMP) eight (8) discrete soil samples, in addition to eleven (11) of the original samples were reanalyzed for arsenic.

  In light of the planned development of the land for residential purposes, these findings were presented to the CCCHMP for review and concurrence that no further action is necessary with respect to historical pesticide use onsite for residential development to occur. The CCCHMP agreed that historical pesticide use at the site does not pose a threat to human health or the environment and no further action is required for this site.

- An inactive irrigation well was observed at the east side of the subject property. This well is not currently in use and is not planned for future use. Based on the current nature of the well, its presence is not expected to represent a significant environmental concern. However, in accordance with best management practices the well should be properly destroyed under proper agency oversight.

- An inactive water well, inferred to have been used in conjunction with the historical residences onsite, was observed on the western side of the subject property. This well is not

currently in use, and based on the current nature of the well its presence is not expected to represent a significant environmental concern. However, in accordance with best management practices the well should be properly destroyed under proper agency oversight.

- A natural gas production well, identified as Sciortino 1-7, is located along the eastern side of the property. According to Mr. Thomas, the natural gas well is currently active. As part of the investigation of the suspected USTs, AEI collected a shallow soil sample from a boring (SB-13) near this well and the associated small condensate tank. The soil sample was analyzed for petroleum hydrocarbons. Very low concentrations of heavy range hydrocarbons were detected, up to 5.6 mg/kg, well below concentrations of concern or indicating a significant release. Based on these factors, the presence of the natural gas production well is not expected to represent a significant environmental concern. However, AEI understands the subject property is planned for redevelopment for residential and civic use. As such, if the gas production well on the property is to be abandoned, remain idle, or begin producing in the future, the Department of Oil and Gas (DOG) should be contacted for the relevant standards and guidelines.

- An interview was conducted with Mr. Enrico Cinquini during a previous Phase I Environmental Site Assessment Update performed for the subject property. Mr. Cinquini was identified in the report as the previous owner of the subject property. According to Mr. Cinquini, the former onsite residents utilized a septic system. One tank is associated with this system. Since the houses are no longer present, the septic system is currently not in use. The location of the tank is unknown, and no records pertaining to the removal of the tanks were available for review at the local agencies. Septic systems represent an environmental concern due to the potential for these systems to act as conduits to the subsurface of a property. However, historical resources do not indicate the use of significant quantities of hazardous materials (other than pesticides and petroleum products store within on-site USTs) at the residence. Based on this information, the former septic system is not expected to represent a significant environmental concern. However, the septic system may need to be properly abandoned/decommissioned prior to redevelopment.

Conclusions, Opinions, and Recommendations

We have performed a Phase I Environmental Site Assessment for the property located at Brentwood Boulevard and Sand Creek Road, APNs 016-170-011 and -012 in the City of Brentwood, Contra Costa County, California, in conformance with the scope and limitations of ASTM Standard Practice E1527-05 and the Environmental Protection Agency Standards and Practices for All Appropriate Inquiries (40 CFR Part 312). Any exceptions to, or deletions from, this practice are described in Section 1.2 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property. AEI recommends no further investigations for the subject property at this time.

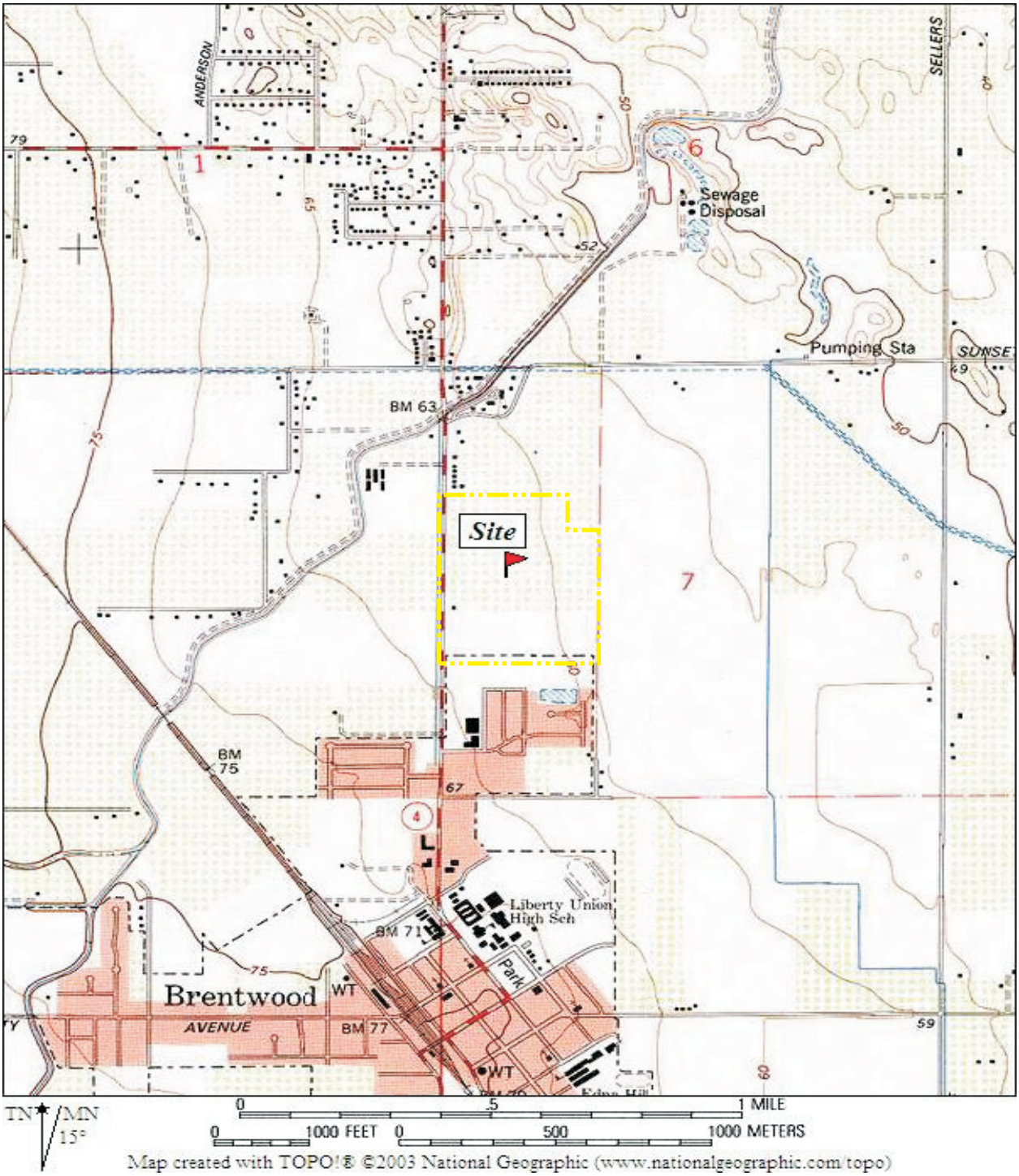
8.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONALS

By signing this report, the senior author declares that, to the best of his or her professional knowledge and belief, he or she meets the definition of *Environmental Professional* as defined in §312.10 of 40 CFR Part 312.

The senior author has the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. The senior author has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40CFR Part 312.

Prepared By:	Reviewed By:
Nathan Ferguson	Peter McIntyre, REA
Project Manager	Senior Author

FIGURES



N

USGS TOPOGRAPHIC MAP
BRENTWOOD QUADRANGLE
Created 1975, Revised 1978

SITE LOCATION MAP

APN 016-170-010
Brentwood, California 94513

FIGURE 1
Job No: 274250

AEI

LEGEND

N

Subject Property Line

Water Well

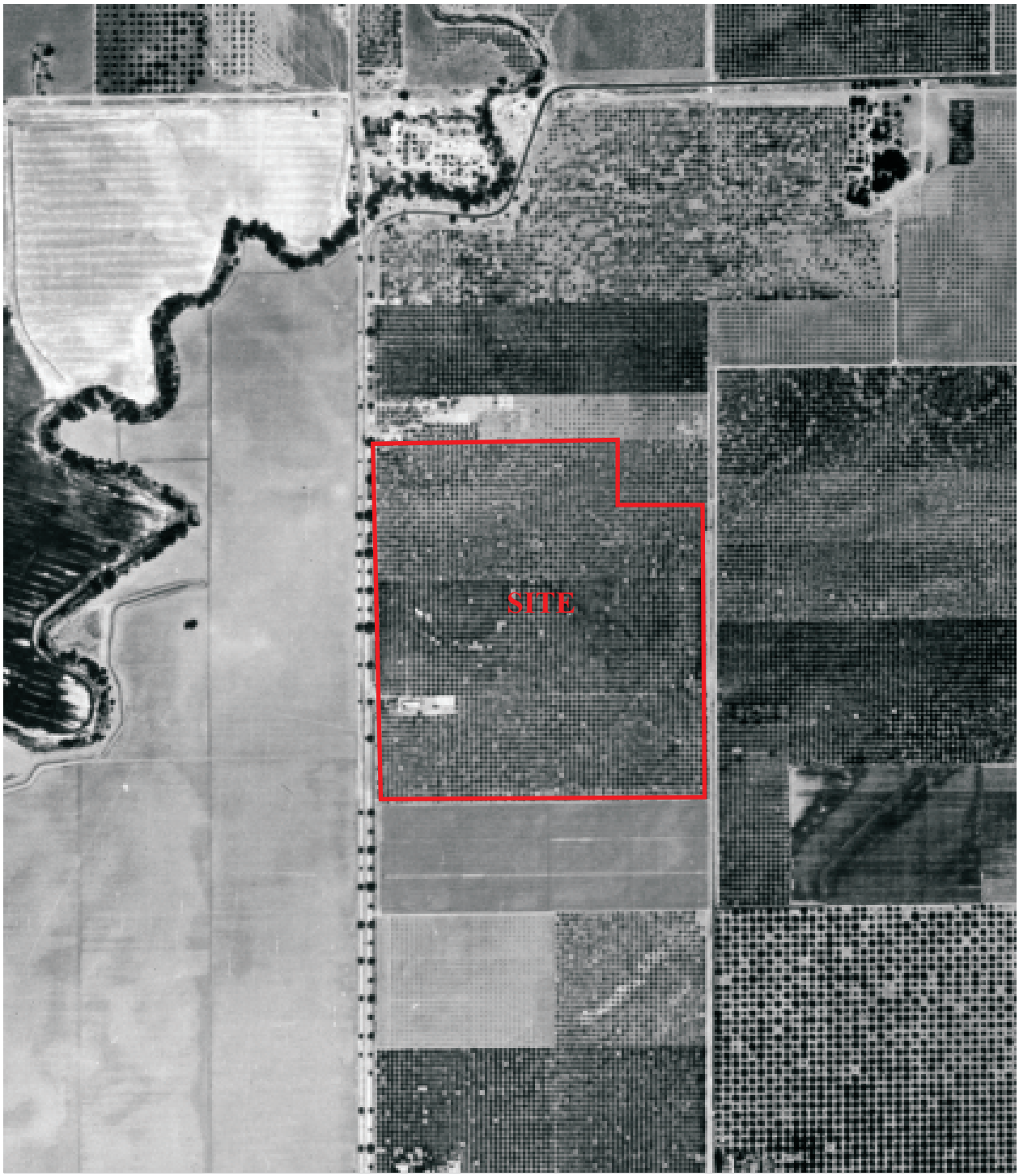
Irrigation Well

SITE MAP

APN 016-170-010
Brentwood, California 94513

FIGURE 2
Job No: 274250

AEI



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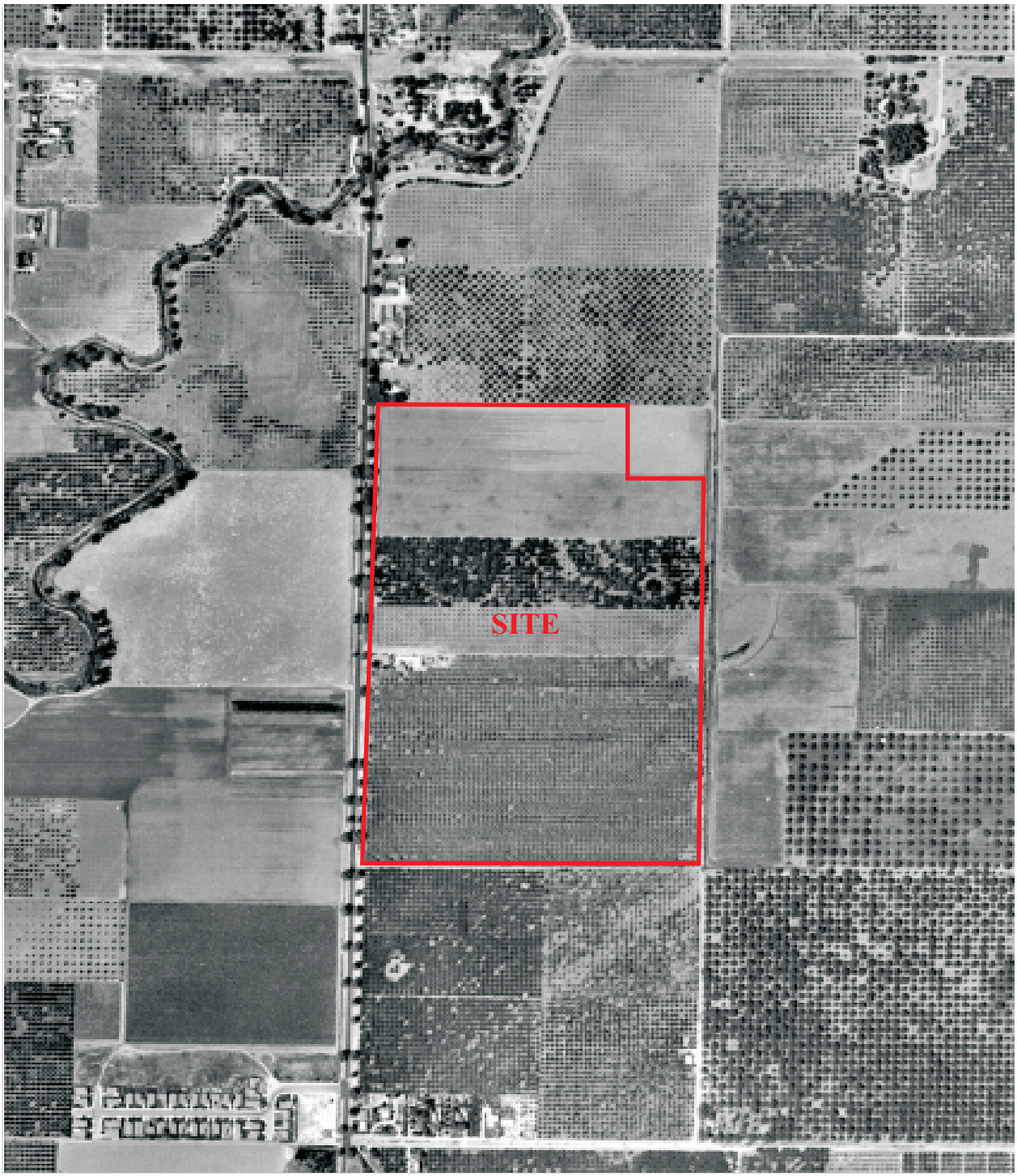
SOURCE: EDR
YEAR: 1939

AERIAL PHOTOGRAPH

APN 016-170-010
Brentwood, California 94513

FIGURE 3
Job No: 274250

AEI



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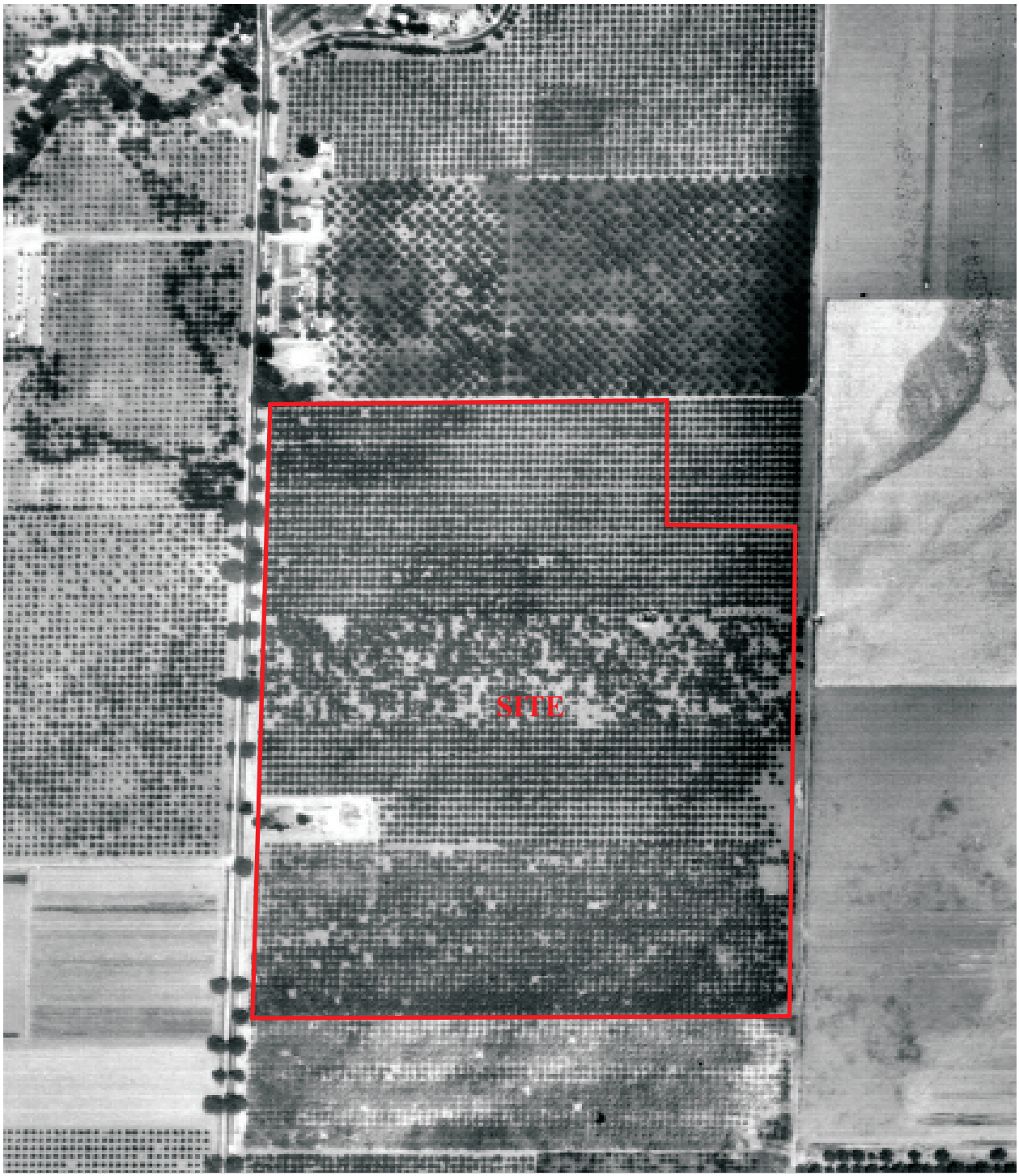
AERIAL PHOTOGRAPH

APN 016-170-010
Brentwood, California 94513

FIGURE 3
Job No: 274250

AEI



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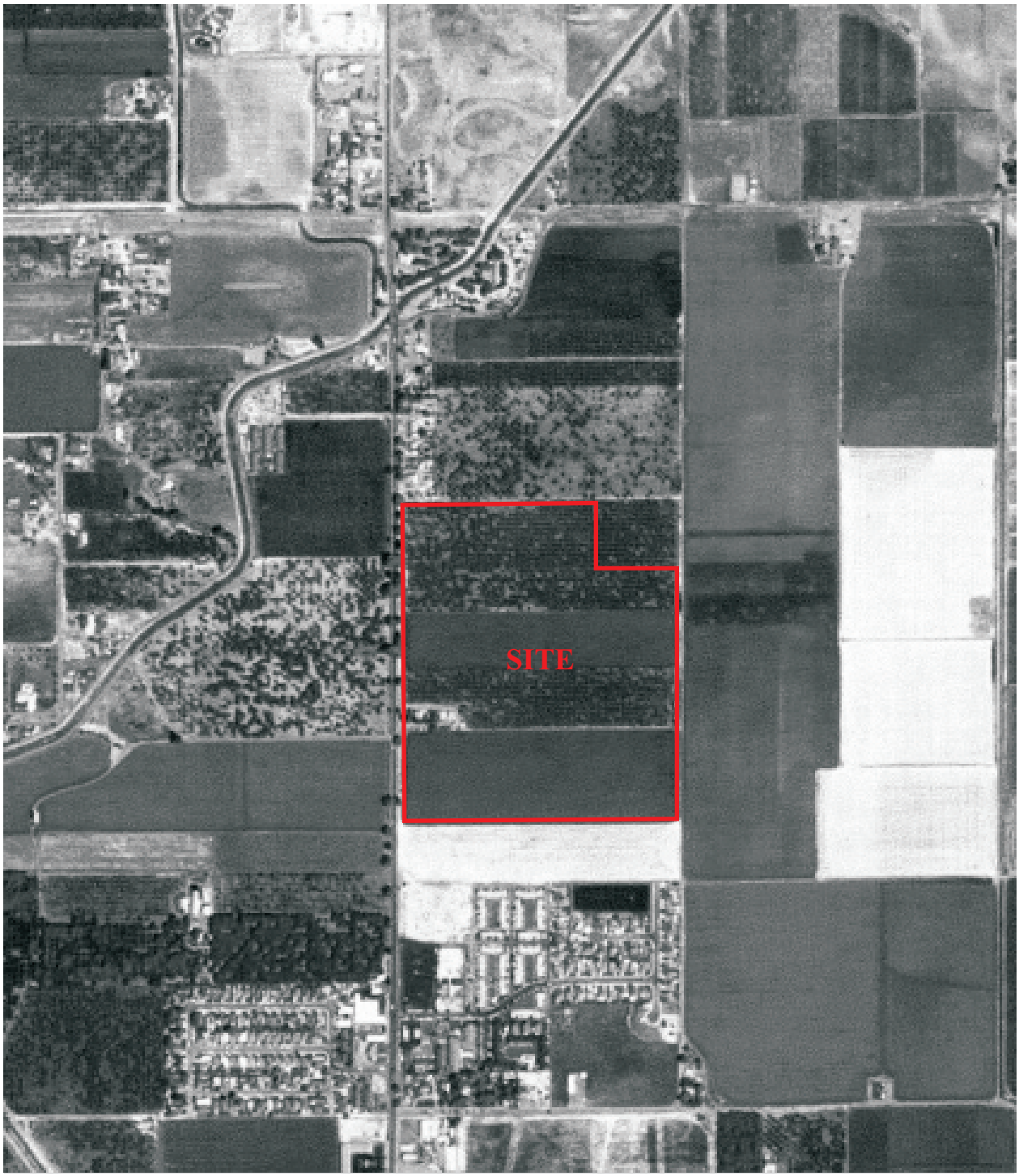
YEAR: 1965

AERIAL PHOTOGRAPH

APN 016-170-010
Brentwood, California 94513

FIGURE 3
Job No: 274250

AEI



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SOURCE: EDR
YEAR: 1982

AERIAL PHOTOGRAPH

APN 016-170-010
Brentwood, California 94513

FIGURE 3
Job No: 274250

AEI

N

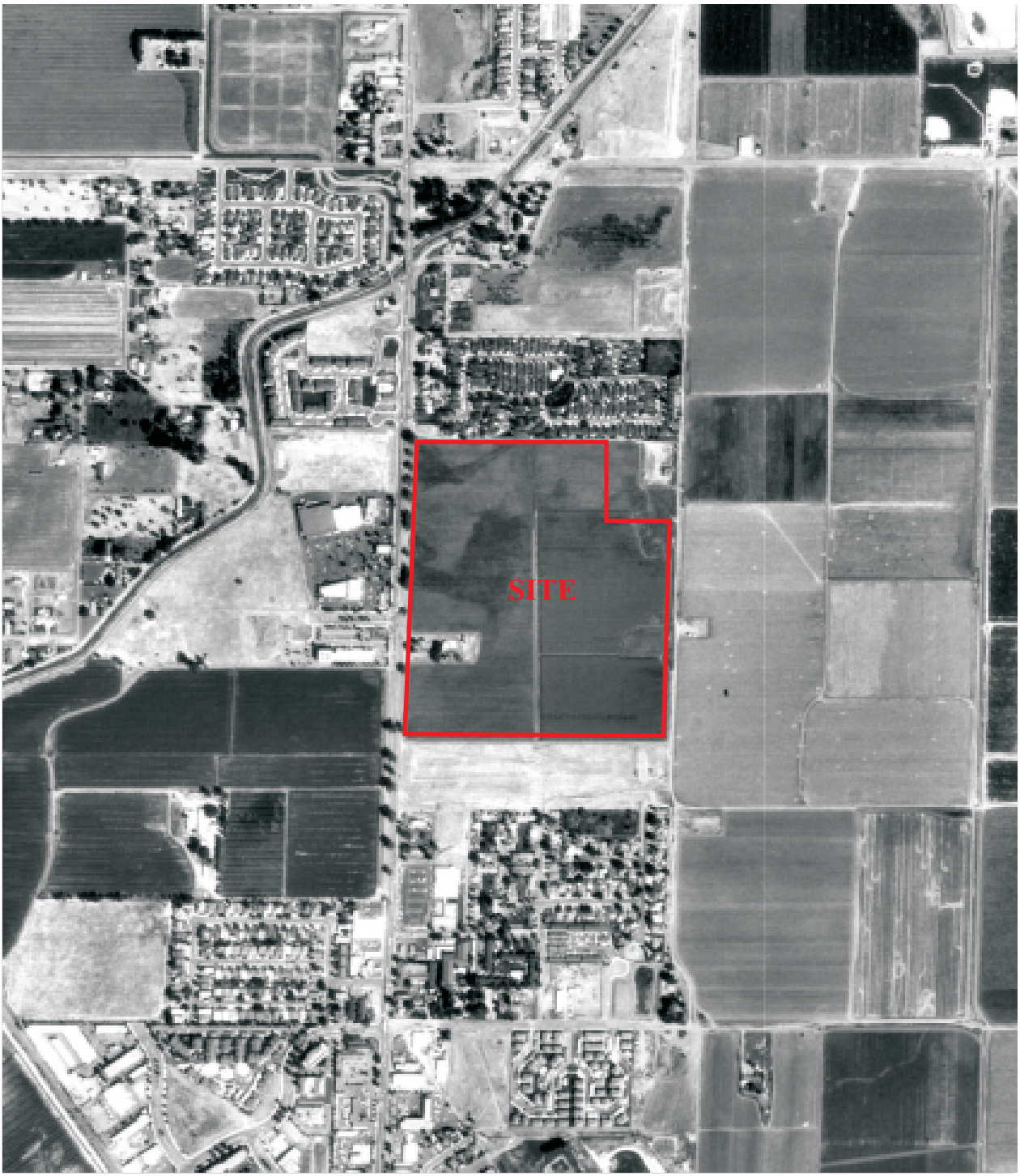
SOURCE: EDR
YEAR: 1993

AERIAL PHOTOGRAPH

APN 016-170-010
Brentwood, California 94513

FIGURE 3
Job No: 274250

AEI



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SOURCE: EDR
YEAR:1998

AERIAL PHOTOGRAPH

APN 016-170-010
Brentwood, California 94513

FIGURE 3
Job No: 274250

AEI

APPENDIX A

PROPERTY PHOTOGRAPHS

1. View of the southern portion of the subject property from the west, facing southeast.

2. View of the eastern side of the subject property from the north, facing south.

3. View of the western side of the subject property from the north, facing south.

PROPERTY PHOTOGRAPHS

APN 016-170-010
Brentwood, California 94513

Job No: 274250

AEI

4. View of the northern portion of the subject property from the south, facing north.

5. View of the location of the former residences and associate structures on the west side of the subject property, facing east.

6. View of the concrete pad associated with the former residence or associated structures on the west side of the subject property, facing northeast.

PROPERTY PHOTOGRAPHS

APN 016-170-010
Brentwood, California 94513

Job No: 274250

AEI

7. View of the water well on the west side of the subject property, located near the former residences and associated structures.

8. View of the irrigation well on the eastern side of the subject property.

9. View of domestic solid waste on the western side of the subject property.

PROPERTY PHOTOGRAPHS

APN 016-170-010
Brentwood, California 94513

Job No: 274250

AEI

10. View of the inactive natural gas well (Sciortino 1-7) on the eastern side of the subject property.

11. View of the initial stages of road development on the subject property, facing east.

PROPERTY PHOTOGRAPHS

APN 016-170-010
Brentwood, California 94513

Job No: 274250

AEI

APPENDIX B

REGULATORY DATABASE

The EDR Radius Map
with GeoCheck®

274250
APN #016-170-010
Brentwood, CA 94513

Inquiry Number: 2003264.2s

August 13, 2007

EDR® Environmental Data Resources Inc

The Standard in Environmental Risk Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

APN #016-170-010
BRENTWOOD, CA 94513

COORDINATES

Latitude (North):	37.947200 - 37˚ 56' 49.9''
Longitude (West):	121.693400 - 121˚ 41' 36.2''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	614803.5
UTM Y (Meters):	4200556.5
Elevation:	61 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	37121-H6 BRENTWOOD, CA
Most Recent Revision:	1978

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
Delisted NPL..... National Priority List Deletions
NPL LIENS..... Federal Superfund Liens
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
CORRACTS..... Corrective Action Report
RCRA-TSDF..... Resource Conservation and Recovery Act Information
RCRA-LQG..... Resource Conservation and Recovery Act Information
ERNS..... Emergency Response Notification System

EXECUTIVE SUMMARY

HMIRS	Hazardous Materials Information Reporting System
US ENG CONTROLS	Engineering Controls Sites List
US INST CONTROL	Sites with Institutional Controls
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
US BROWNFIELDS	A Listing of Brownfields Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
ODI	Open Dump Inventory
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS	Section 7 Tracking Systems
LIENS 2	CERCLA Lien Information
RADINFO	Radiation Information Database
US CDL	Clandestine Drug Labs
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
ICIS	Integrated Compliance Information System
LUCIS	Land Use Control Information System
DOT OPS	Incident and Accident Data
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
MINES	Mines Master Index File
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

HIST Cal-Sites	Historical Calsites Database
CA BOND EXP. PLAN	Bond Expenditure Plan
SCH	School Property Evaluation Program
Toxic Pits	Toxic Pits Cleanup Act Sites
CA WDS	Waste Discharge System
WMUDS/SWAT	Waste Management Unit Database
SLIC	Statewide SLIC Cases
LIENS	Environmental Liens Listing
AST	Aboveground Petroleum Storage Tank Facilities
CHMIRS	California Hazardous Material Incident Report System
Notify 65	Proposition 65 Records
DEED	Deed Restriction Listing
VCP	Voluntary Cleanup Program Properties
WIP	Well Investigation Program Case List
CDL	Clandestine Drug Labs
RESPONSE	State Response Sites
HAZNET	Facility and Manifest Data
EMI	Emissions Inventory Data
HAULERS	Registered Waste Tire Haulers Listing
ENVIROSTOR	EnviroStor Database

TRIBAL RECORDS

INDIAN RESERV	Indian Reservations
INDIAN LUST	Leaking Underground Storage Tanks on Indian Land

EXECUTIVE SUMMARY

INDIAN UST..... Underground Storage Tanks on Indian Land

EDR PROPRIETARY RECORDS

Manufactured Gas Plants... EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL RECORDS

RCRAInfo: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System(RCRIS). The database includes selective information on sites which generate, transport, store , treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month Large quantity generators generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-SQG list, as provided by EDR, and dated 06/13/2006 has revealed that there are 2 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
IRS ONE HOUR CLEANERS	***41 SANDCREEK RD# B***	***0 - 1/8 W***	***7***	***8***
BYER S AUTO BODY REPAIR	***1377 HIGHWAY 4***	***1/8 - 1/4 S***	***14***	***21***

STATE AND LOCAL RECORDS

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database.

A review of the SWF/LF list, as provided by EDR, and dated 06/11/2007 has revealed that there is 1 SWF/LF site within approximately 0.5 miles of the target property.

EXECUTIVE SUMMARY

Lower Elevation	Address	Dist / Dir	Map ID	Page
BRENTWOOD SOLID WASTE TRANSFER	2300 ELKINS WAY	1/4 - 1/2 NE	18	28

CORTESE: This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency/Office of Emergency Information.

A review of the Cortese list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 Cortese site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BEACON STATION #544	***7920 BRENTWOOD BLVD***	***1/4 - 1/2 S***	***17***	***25***

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 07/09/2007 has revealed that there is 1 SWRCY site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
TOMRA PACIFIC INC/CENTRO MART	7820 BRENTWOOD BLVD	1/4 - 1/2 S	15	23

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 07/10/2007 has revealed that there are 3 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FIRST STOP AUTO MART	***7935 BRENTWOOD BLVD***	***1/8 - 1/4 S***	***C9***	***14***
SAVER'S SS	2323 HWY 4	1/4 - 1/2 S	16	23
Facility Status: Case Closed				
BEACON STATION #544	***7920 BRENTWOOD BLVD***	***1/4 - 1/2 S***	***17***	***25***
Facility Status: Preliminary site assessment workplan submitted				

CA FID: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BRENTWOOD SHELL SERVICE	***1355 HIGHWAY 4***	***1/8 - 1/4 SSW***	***D11***	***17***

EXECUTIVE SUMMARY

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 07/10/2007 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FIRST STOP AUTO MART	***7935 BRENTWOOD BLVD***	***1/8 - 1/4 S***	***C9***	***14***

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 2 HIST UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BRENTWOOD SHELL SERVICE	1355 HIGHWAY 4	1/8 - 1/4 SSW	D12	19
BEACON STATION #544	1380 HIGHWAY 4	1/8 - 1/4 SSW	13	20

SL: Lists includes sites from the Underground Tank Program, Hazardous Waste Generator Program & Business Plan 12185 Program

A review of the CONTRA COSTA CO. SITE LIST list, as provided by EDR, and dated 05/29/2007 has revealed that there are 7 CONTRA COSTA CO. SITE LIST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SPEEDEE OIL CHANGE & TUNE UP	7377 BRENTWOOD BLVD	0 - 1/8 W	1	6
IRS 1 HR CLEANERS	41 SAND CREEK RD #B	0 - 1/8 W	A2	6
MARSH CREEK APARTMENTS	7251 BRENTWOOD BLVD	0 - 1/8 N	4	7
BRENTWOOD TIRE COMPANY	***7885 BRENTWOOD BLVD***	***0 - 1/8 S***	***B5***	***7***
K & D RV SERVICE	7893 BRENTWOOD BLVD	0 - 1/8 S	B6	8
ACCURATE AUTO BODY & PAINT	***7911 BRENTWOOD BLVD***	***0 - 1/8 S***	***8***	***12***
FIRST STOP GAS	7935 BRENTWOOD BLVD	1/8 - 1/4 S	C10	17

SWEEPS: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1980's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 2 SWEEPS UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
FIRST STOP AUTO MART	***7935 BRENTWOOD BLVD***	***1/8 - 1/4 S***	***C9***	***14***
BRENTWOOD SHELL SERVICE	***1355 HIGHWAY 4***	***1/8 - 1/4 SSW***	***D11***	***17***

EXECUTIVE SUMMARY

DRYCLEANERS: A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaners' agents; linen supply; coin-operated laundries and cleaning; drycleaning plants except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

A review of the CLEANERS list, as provided by EDR, and dated 07/31/2007 has revealed that there are 2 CLEANERS sites within approximately 0.25 miles of the target property.

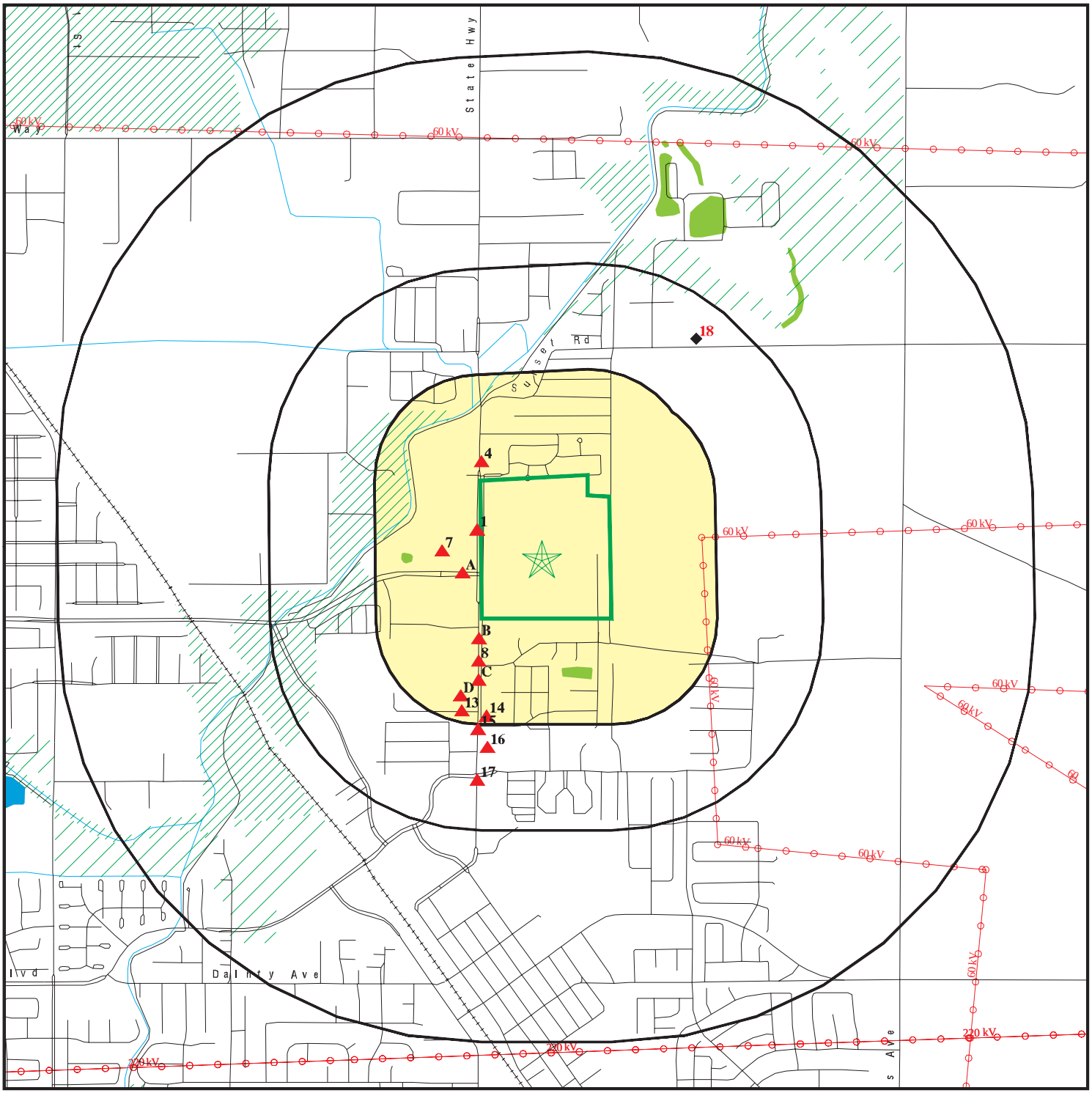
Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
I R S ONE HOUR CLEANERS	41 SAND CREEK RD #B	0 - 1/8 W	A3	6
IRS ONE HOUR CLEANERS	***41 SANDCREEK RD# B***	***0 - 1/8 W***	***7***	***8***

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
NORMAN'S BRENTWOOD NURSERY	CA FID UST, CONTRA COSTA CO. SITE LIST, SWEEPS UST
SAVERS GAS	CA FID UST, SWEEPS UST
BILL BRANDT FORD, INC.	CA FID UST, CONTRA COSTA CO. SITE LIST, SWEEPS UST
DELTA FENCE CO., INC.	SWEEPS UST
MANGINI BROS	HIST UST, SWEEPS UST
LADD, L. JORDAN	SWEEPS UST
CHEAPER! #151	CA FID UST, CONTRA COSTA CO. SITE LIST, SWEEPS UST
CHEAPERI #151	SWEEPS UST
BLUE GOOSE PROPERTIES	LUST, Cortese
MANGINI BROS	UST, CONTRA COSTA CO. SITE LIST
LADD, L. JORDAN	UST, CONTRA COSTA CO. SITE LIST
L. JORDAN LADD	HIST UST
BRENTWOOD PRODUCTION YARD	HIST UST
BETTENCOURT, EVELYN T	CONTRA COSTA CO. SITE LIST
CAL TRANS HIGHWAY WIDENING	CONTRA COSTA CO. SITE LIST
MARSH CREEK #2 DEHYDRATION STATION	CONTRA COSTA CO. SITE LIST
SHIROYAMA FARM	CONTRA COSTA CO. SITE LIST
ZORIA FARMS, INC	CONTRA COSTA CO. SITE LIST
EOG RESOURCES, INC	CONTRA COSTA CO. SITE LIST
NICHOLSON COMPANY	CONTRA COSTA CO. SITE LIST

OVERVIEW MAP - 2003264.2s



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 274250	CLIENT: AEI Consultants
ADDRESS: APN #016-170-010 Brentwood CA 94513	CONTACT: Keri Robinson
LAT/LONG: 37.9472 / 121.6934	INQUIRY #: 2003264.2s
	DATE: August 13, 2007 1:56 pm

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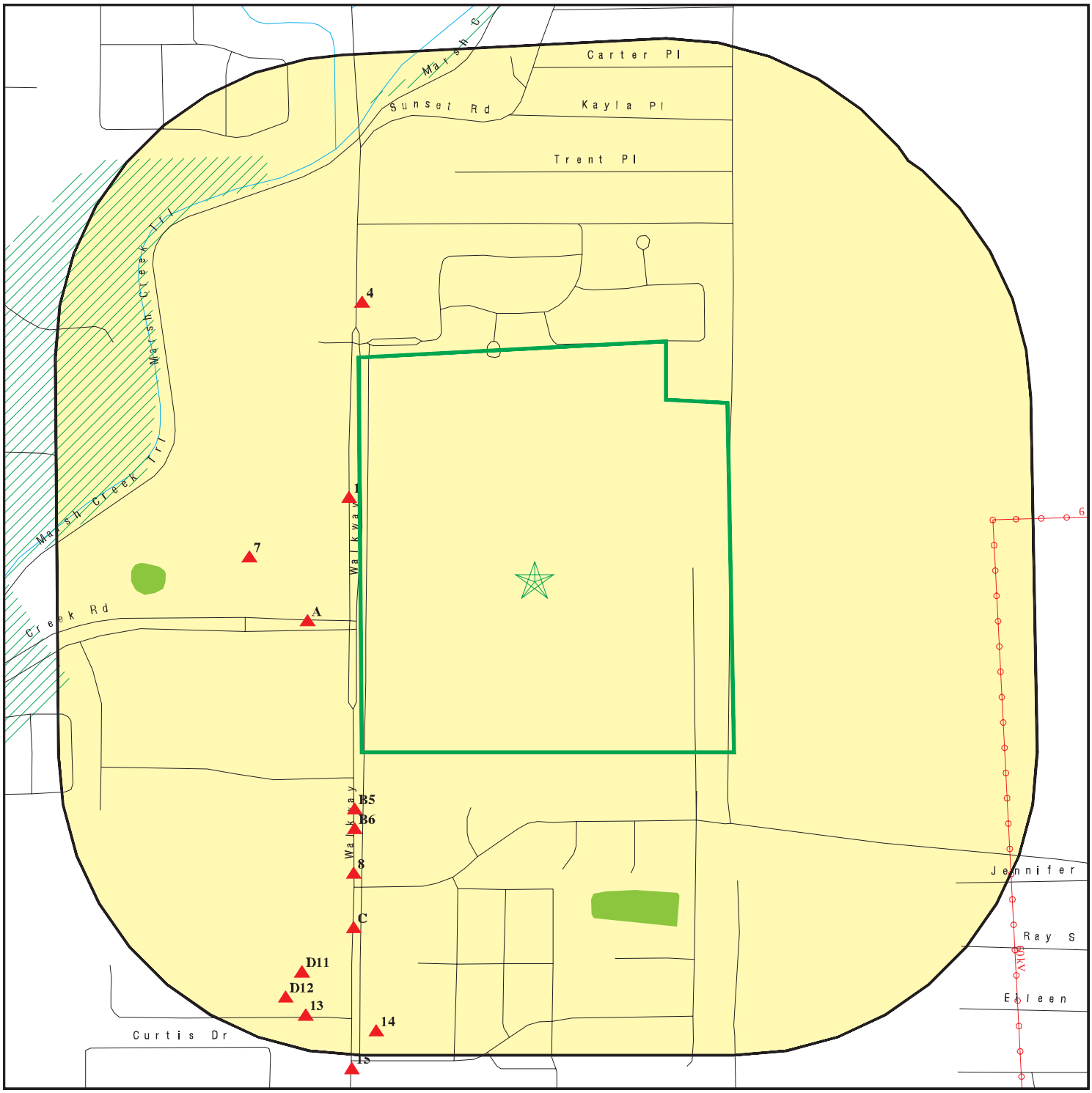
DETAIL MAP - 2003264.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines

100-year flood zone

500-year flood zone

National Wetland Inventory

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 274250	CLIENT: AEI Consultants
ADDRESS: APN #016-170-010 Brentwood CA 94513	CONTACT: Keri Robinson INQUIRY #: 2003264.2s
LAT/LONG: 37.9472 / 121.6934	DATE: August 13, 2007 1:56 pm

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MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL RECORDS								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
NPL LIENS		TP	NR	NR	NR	NR	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.500	0	0	0	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRA TSD		1.000	0	0	0	0	NR	0
RCRA Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRA Sm. Quan. Gen.		0.250	1	1	NR	NR	NR	2
ERNS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
FUDS		1.000	0	0	0	0	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
LIENS 2		TP	NR	NR	NR	NR	NR	0
RADINFO		TP	NR	NR	NR	NR	NR	0
CDL		TP	NR	NR	NR	NR	NR	0
HIST FTTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
LUCIS		0.500	0	0	0	NR	NR	0
DOT OPS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
STATE AND LOCAL RECORDS								
Hist Cal-Sites		1.000	0	0	0	0	NR	0
CA Bond Exp. Plan		1.000	0	0	0	0	NR	0
SCH		0.250	0	0	NR	NR	NR	0
Toxic Pits		1.000	0	0	0	0	NR	0
State Landfill		0.500	0	0	1	NR	NR	1
CA WDS		TP	NR	NR	NR	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
Cortese		0.500	0	0	1	NR	NR	1

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SWRCY		0.500	0	0	1	NR	NR	1
LUST		0.500	0	1	2	NR	NR	3
CA FID UST		0.250	0	1	NR	NR	NR	1
SLIC		0.500	0	0	0	NR	NR	0
UST		0.250	0	1	NR	NR	NR	1
HIST UST		0.250	0	2	NR	NR	NR	2
LIENS		TP	NR	NR	NR	NR	NR	0
AST		0.250	0	0	NR	NR	NR	0
Contra Costa Co. Site List		0.250	6	1	NR	NR	NR	7
SWEEPS UST		0.250	0	2	NR	NR	NR	2
CHMIRS		TP	NR	NR	NR	NR	NR	0
Notify 65		1.000	0	0	0	0	NR	0
DEED		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
DRYCLEANERS		0.250	2	0	NR	NR	NR	2
WIP		0.250	0	0	NR	NR	NR	0
CDL		TP	NR	NR	NR	NR	NR	0
RESPONSE		1.000	0	0	0	0	NR	0
HAZNET		TP	NR	NR	NR	NR	NR	0
EMI		TP	NR	NR	NR	NR	NR	0
HAULERS		TP	NR	NR	NR	NR	NR	0
ENVIROSTOR		1.000	0	0	0	0	NR	0
TRIBAL RECORDS								
INDIAN RESERV		1.000	0	0	0	0	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
EDR PROPRIETARY RECORDS								
Manufactured Gas Plants		1.000	0	0	0	0	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number
1 **West** **< 1/8** **46 ft.**	**SPEEDEE OIL CHANGE & TUNE UP** **7377 BRENTWOOD BLVD** **BRENTWOOD, CA**	**CONTRA COSTA CO. SITE LIST**	**S105455175** **N/A**

Relative:
Higher

Actual:
61 ft.

CONTRA COSTA CO. SITE LIST:

Region:	CONTRA COSTA
Facility ID:	771508
Facility Status:	ACTIVE
Tier:	Not reported
Program Status:	HWG, Hmmp
Generator Fee Item:	No
Inactive Date:	Not reported

A2 **West** **< 1/8** **232 ft.**	**IRS 1 HR CLEANERS** **41 SAND CREEK RD #B** **BRENTWOOD, CA 94513**	**CONTRA COSTA CO. SITE LIST**	**S105266288** **N/A**

Site 1 of 2 in cluster A

Relative:
Higher

Actual:
65 ft.

CONTRA COSTA CO. SITE LIST:

Region:	CONTRA COSTA
Facility ID:	770440
Facility Status:	INACTIVE
Tier:	Not reported
Program Status:	Not reported
Generator Fee Item:	Yes
Inactive Date:	2006-04-27 00:00:00

A3 **West** **< 1/8** **232 ft.**	**I R S ONE HOUR CLEANERS** **41 SAND CREEK RD #B** **BRENTWOOD, CA 94513**	**CLEANERS**	**S106661935** **N/A**

Site 2 of 2 in cluster A

Relative:
Higher

Actual:
65 ft.

CLEANERS:

EPA Id:	CAX000245209
NAICS Code:	Not reported
NAICS Description:	Not reported
SIC Code:	Not reported
Create Date:	7/17/1985
Facility Active:	No
Inactive Date:	4/30/1986
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	MICHAEL MILLS
Mailing Address 2:	Not reported
Mailing State:	CA
Mailing Zip:	945130000
Region Code:	2
Owner Name:	--
Owner Address:	--
Owner Address 2:	Not reported
Owner Telephone:	0
Contact Name:	MICHAEL MILLS
Contact Address:	NO LONGER AT THIS ADDRESS
Contact Address 2:	Not reported
Contact Telephone:	4156342811

I R S ONE HOUR CLEANERS (Continued) **S106661935**

SIC Description: Not reported

4
North
< 1/8
243 ft.

MARSH CREEK APARTMENTS **CONTRA COSTA CO. SITE LIST** **S102260049**
7251 BRENTWOOD BLVD **N/A**
BRENTWOOD, CA 94513

Relative:
Higher

Actual:
61 ft.

CONTRA COSTA CO. SITE LIST:

Region:	CONTRA COSTA
Facility ID:	772161
Facility Status:	INACTIVE
Tier:	Not reported
Program Status:	Hmmp
Generator Fee Item:	No
Inactive Date:	2000-04-06 00:00:00

B5
South
< 1/8
247 ft.

BRENTWOOD TIRE COMPANY **HAZNET** **S103172123**
7885 BRENTWOOD BLVD **CONTRA COSTA CO. SITE LIST** **N/A**
BRENTWOOD, CA 94513

Site 1 of 2 in cluster B

Relative:
Higher

Actual:
66 ft.

HAZNET:

Gepaid:	CAL000260038
Contact:	DAVID LENNOL
Telephone:	9255168700
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	7885 BRENTWOOD BLVD
Mailing City,St,Zip:	BRENTWOOD, CA 94513
Gen County:	Contra Costa
TSD EPA ID:	Not reported
TSD County:	Contra Costa
Waste Category:	Unspecified oil-containing waste
Disposal Method:	Transfer Station
Tons:	0.41
Facility County:	Not reported

CONTRA COSTA CO. SITE LIST:

Region:	CONTRA COSTA
Facility ID:	772601
Facility Status:	INACTIVE
Tier:	Not reported
Program Status:	Not reported
Generator Fee Item:	Yes
Inactive Date:	2002-01-14 00:00:00

B6
South
< 1/8
332 ft.

Relative:
Higher

Actual:
67 ft.

K & D RV SERVICE
7893 BRENTWOOD BLVD
BRENTWOOD, CA 94513

CONTRA COSTA CO. SITE LIST

S103172124
N/A

Site 2 of 2 in cluster B

CONTRA COSTA CO. SITE LIST:

Region:	CONTRA COSTA
Facility ID:	772602
Facility Status:	INACTIVE
Tier:	Not reported
Program Status:	Not reported
Generator Fee Item:	Yes
Inactive Date:	2004-12-23 00:00:00

7
West
< 1/8
482 ft.

Relative:
Higher

Actual:
61 ft.

IRS ONE HOUR CLEANERS
41 SANDCREEK RD# B
BRENTWOOD, CA 94513

RCRA-SQG
FINDS
HAZNET
CLEANERS

1000126833
CAD981396724

RCRAInfo:

Owner:	NOT REQUIRED (415) 555-1212
EPA ID:	CAD981396724
Contact:	Not reported
Classification:	Small Quantity Generator
TSDF Activities:	Not reported
Violation Status:	No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site

The NEI (National Emissions Inventory) database contains information on stationary and mobile sources that emit criteria air pollutants and their precursors, as well as hazardous air pollutants (HAPs).

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:

Gepaid:	CAD981396724
Contact:	IRS ONE HOUR CLEANERS
Telephone:	0000000000
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	41 SAND CREEK RD # B
Mailing City,St,Zip:	BRENTWOOD, CA 945130000
Gen County:	7
TSD EPA ID:	CAD981397417

IRS ONE HOUR CLEANERS (Continued) **1000126833**

TSD County: Los Angeles
Waste Category: Not reported
Disposal Method: Recycler
Tons: 0
Facility County: 7

Gepaid: CAD981396724
Contact: IRS ONE HOUR CLEANERS
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 41 SAND CREEK RD # B
Mailing City,St,Zip: BRENTWOOD, CA 945130000
Gen County: 7
TSD EPA ID: CAD981397417
TSD County: Los Angeles
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Recycler
Tons: 1.2847
Facility County: 7

Gepaid: CAL000008973
Contact: ORSL NEAL OR JUDITH
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 41 SANDCREEK RD
Mailing City,St,Zip: BRENTWOOD, CA 000000000
Gen County: 7
TSD EPA ID: CAL000161743
TSD County: Santa Clara
Waste Category: Unspecified oil-containing waste
Disposal Method: Transfer Station
Tons: .7506
Facility County: 7

Gepaid: CAD981396724
Contact: IRS ONE HOUR CLEANERS
Telephone: 0000000000
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 41 SAND CREEK RD # B
Mailing City,St,Zip: BRENTWOOD, CA 945130000
Gen County: 7
TSD EPA ID: CAD981397417
TSD County: Los Angeles
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Recycler
Tons: .7347
Facility County: 7

Gepaid: CAD981396724
Contact: IRS ONE HOUR CLEANERS
Telephone: 0000000000
Facility Addr2: Not reported

IRS ONE HOUR CLEANERS (Continued) **1000126833**

Mailing Name: Not reported
Mailing Address: 41 SAND CREEK RD # B
Mailing City,St,Zip: BRENTWOOD, CA 945130000
Gen County: 7
TSD EPA ID: CA0000084517
TSD County: Sacramento
Waste Category: Liquids with halogenated organic compounds > 1000 mg/l
Disposal Method: Transfer Station
Tons: .3750
Facility County: 7

Click this hyperlink while viewing on your computer to access
1 additional CA_HAZNET: record(s) in the EDR Site Report.

CLEANERS:
EPA Id: CAD981396724
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7216
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2001
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 41 SANDCREEK RD #B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 945130000
Region Code: 2
Owner Name: IRS ONE HOUR CLEANERS
Owner Address: 41 SANDCREEK RD #B
Owner Address 2: Not reported
Owner Telephone: Not reported
Contact Name: JUDITH E ORSI
Contact Address: 41 SANDCREEK RD #B
Contact Address 2: Not reported
Contact Telephone: 9256342811
SIC Description: Drycleaning Plants Except Rug CleaningGarment Pressing and Agents for Laundries and DrycleanersPower Laundries Family and CommercialLaundry and Garment Services NEC (except diaper service and clothing alteration and repair)

EPA Id: CAD981396724
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7219
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2001
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 41 SANDCREEK RD #B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 945130000
Region Code: 2
Owner Name: IRS ONE HOUR CLEANERS
Owner Address: 41 SANDCREEK RD #B

IRS ONE HOUR CLEANERS (Continued) **1000126833**

Owner Address 2: Not reported
Owner Telephone: Not reported
Contact Name: JUDITH E ORSI
Contact Address: 41 SANDCREEK RD #B
Contact Address 2: Not reported
Contact Telephone: 9256342811
SIC Description: Drycleaning Plants Except Rug CleaningGarment Pressing and Agents for Laundries and DrycleanersPower Laundries Family and CommercialLaundry and Garment Services NEC (except diaper service and clothing alteration and repair)

EPA Id: CAD981396724
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7211
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2001
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 41 SANDCREEK RD #B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 945130000
Region Code: 2
Owner Name: IRS ONE HOUR CLEANERS
Owner Address: 41 SANDCREEK RD #B
Owner Address 2: Not reported
Owner Telephone: Not reported
Contact Name: JUDITH E ORSI
Contact Address: 41 SANDCREEK RD #B
Contact Address 2: Not reported
Contact Telephone: 9256342811
SIC Description: Drycleaning Plants Except Rug CleaningGarment Pressing and Agents for Laundries and DrycleanersPower Laundries Family and CommercialLaundry and Garment Services NEC (except diaper service and clothing alteration and repair)

EPA Id: CAD981396724
NAICS Code: 81232
NAICS Description: Drycleaning and Laundry Services (except Coin-Operated)
SIC Code: 7212
Create Date: 4/10/1987
Facility Active: No
Inactive Date: 6/30/2001
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 41 SANDCREEK RD #B
Mailing Address 2: Not reported
Mailing State: CA
Mailing Zip: 945130000
Region Code: 2
Owner Name: IRS ONE HOUR CLEANERS
Owner Address: 41 SANDCREEK RD #B
Owner Address 2: Not reported
Owner Telephone: Not reported
Contact Name: JUDITH E ORSI
Contact Address: 41 SANDCREEK RD #B
Contact Address 2: Not reported

IRS ONE HOUR CLEANERS (Continued) **1000126833**

Contact Telephone: 9256342811
SIC Description: Drycleaning Plants Except Rug CleaningGarment Pressing and Agents for Laundries and DrycleanersPower Laundries Family and CommercialLaundry and Garment Services NEC (except diaper service and clothing alteration and repair)

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8 South < 1/8 525 ft. | **ACCURATE AUTO BODY & PAINT**
7911 BRENTWOOD BLVD
BRENTWOOD, CA 94513 | **CONTRA COSTA CO. SITE LIST** **S102260051**
EMI **N/A**

Relative: Higher

Actual: 68 ft.

CONTRA COSTA CO. SITE LIST:

Region:	CONTRA COSTA
Facility ID:	771064
Facility Status:	INACTIVE
Tier:	Not reported
Program Status:	Not reported
Generator Fee Item:	Yes
Inactive Date:	2002-01-14 00:00:00

EMI:

Year:	1995
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF
Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1996
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF
Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1997
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF

ACCURATE AUTO BODY & PAINT (Continued) **S102260051**

Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1998
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF
Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	1999
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF
Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	2000
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF
Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported

ACCURATE AUTO BODY & PAINT (Continued) **S102260051**

Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	2001
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF
Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	1
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

Year:	2002
Carbon Monoxide Emissions Tons/Yr:	7
Air Basin:	SF
Facility ID:	8138
Air District Name:	BA
SIC Code:	7532
Air District Name:	BAY AREA AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	1
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers & Smllr Tons/Yr:	0

C9 **FIRST STOP AUTO MART** **LUST** **U003784173**
South **7935 BRENTWOOD BLVD** **UST** **N/A**
1/8-1/4 **BRENTWOOD, CA 94513** **SWEEPS UST**
762 ft.

Site 1 of 2 in cluster C

Relative: Higher

Actual: 68 ft.

LUST:

Region:	STATE
Case Type:	O, S
Cross Street:	Not reported
Enf Type:	TC
Funding:	Not reported
How Discovered:	OM
How Stopped:	Other Means
Leak Cause:	UNK
Leak Source:	Other Source

FIRST STOP AUTO MART (Continued) **U003784173**

Global Id: T0601343310
Stop Date: 2004-01-13 00:00:00
Confirm Leak: Not reported
Workplan: Not reported
Prelim Assess: Not reported
Pollution Char: Not reported
Remed Plan: Not reported
Remed Action: Not reported
Monitoring: Not reported
Close Date: Not reported
Discover Date: 2004-01-13 00:00:00
Enforcement Dt: Not reported
Release Date: 2004-01-26 00:00:00
Review Date: Not reported
Enter Date: Not reported
MTBE Date: Not reported
GW Qualifier: Not reported
Soil Qualifier: Not reported
Max MTBE GW ppb: Not reported
Max MTBE Soil ppb: Not reported
County: 07
Org Name: Not reported
Reg Board: 5S
Status: Not reported
Chemical: 8006619,1203
Contact Person: Not reported
Responsible Party: CHANDEY
RP Address: 7935 BRENTWOOD BLVD
Interim: Not reported
Oversight Prgm: LUST
MTBE Class: *
MTBE Conc: 0
MTBE Fuel: 0
MTBE Tested: MTBE Detected. Site tested for MTBE and MTBE detected
Staff: PMV
Staff Initials: UNK
Lead Agency: Regional Board
Local Agency: 07000
Hydr Basin #: Not reported
Beneficial: Not reported
Priority: Not reported
Cleanup Fund Id: Not reported
Work Suspended: Not reported
Local Case #: Not reported
Case Number: 070106
Qty Leaked: Not reported
Abate Method: Not reported
Operator: Not reported
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported
Summary: Not reported

LUST:
Region: 5

FIRST STOP AUTO MART (Continued) **U003784173**

Case Number: 070106
Staff Initials: PMV
Substance: Not reported
Case Type: O, S
Status: Not reported
Lead Agency: Regional
Program: LUST
MTBE Code: N/A

UST:
Region: STATE
Local Agency: 07000
Facility ID: 748792

SWEEPS UST:
Status: A
Comp Number: 48791
Number: 2
Board Of Equalization: 44-035521
Ref Date: 03-06-92
Act Date: 05-26-94
Created Date: 05-26-94
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 07-000-048791-000001
Actv Date: 03-06-94
Capacity: 6000
Tank Use: M.V. FUEL
Stg: P
Content: PRM UNLEADED
Number Of Tanks: 4

Status: A
Comp Number: 48791
Number: 2
Board Of Equalization: 44-035521
Ref Date: 03-06-92
Act Date: 05-26-94
Created Date: 05-26-94
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 07-000-048791-000002
Actv Date: 03-06-94
Capacity: 8000
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: Not reported

Status: A
Comp Number: 48791
Number: 2
Board Of Equalization: 44-035521
Ref Date: 03-06-92
Act Date: 05-26-94
Created Date: 05-26-94

FIRST STOP AUTO MART (Continued) **U003784173**

Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	07-000-048791-000003
Actv Date:	03-06-94
Capacity:	8000
Tank Use:	M.V. FUEL
Stg:	P
Content:	LEADED
Number Of Tanks:	Not reported

Status:	A
Comp Number:	48791
Number:	2
Board Of Equalization:	44-035521
Ref Date:	03-06-92
Act Date:	05-26-94
Created Date:	05-26-94
Tank Status:	A
Owner Tank Id:	Not reported
Swrcb Tank Id:	07-000-048791-000004
Actv Date:	03-06-94
Capacity:	550
Tank Use:	OIL
Stg:	W
Content:	WASTE OIL
Number Of Tanks:	Not reported

C10
South
1/8-1/4
762 ft.

Relative:
Higher

Actual:
68 ft.

FIRST STOP GAS **CONTRA COSTA CO. SITE LIST** **S105455180**
7935 BRENTWOOD BLVD **N/A**
BRENTWOOD, CA

Site 2 of 2 in cluster C

CONTRA COSTA CO. SITE LIST:

Region:	CONTRA COSTA
Facility ID:	748792
Facility Status:	ACTIVE
Tier:	Not reported
Program Status:	HWG, UST, Hmmp
Generator Fee Item:	No
Inactive Date:	Not reported

D11
SSW
1/8-1/4
989 ft.

Relative:
Higher

Actual:
68 ft.

BRENTWOOD SHELL SERVICE **CA FID UST** **S101623517**
1355 HIGHWAY 4 **SWEEPS UST** **N/A**
BRENTWOOD, CA 94513

Site 1 of 2 in cluster D

CA FID UST:

Facility ID:	07001416
Regulated By:	UTNKA
Regulated ID:	Not reported
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	4156348954
Mail To:	Not reported

BRENTWOOD SHELL SERVICE (Continued) **S101623517**

Mailing Address: 2304 ROBLES DR
Mailing Address 2: Not reported
Mailing City,St,Zip: BRENTWOOD 94513
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

SWEEPS UST:
Status: A
Comp Number: 48792
Number: 9
Board Of Equalization: 44-002439
Ref Date: 06-20-88
Act Date: Not reported
Created Date: 07-22-88
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 07-000-048792-000002
Actv Date: 06-20-88
Capacity: 8000
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: 3

Status: A
Comp Number: 48792
Number: 9
Board Of Equalization: 44-002439
Ref Date: 06-20-88
Act Date: Not reported
Created Date: 07-22-88
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 07-000-048792-000003
Actv Date: 06-20-88
Capacity: 8121
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: Not reported

Status: A
Comp Number: 48792
Number: 9
Board Of Equalization: 44-002439
Ref Date: 06-20-88
Act Date: Not reported
Created Date: 07-22-88
Tank Status: A
Owner Tank Id: Not reported
Swrcb Tank Id: 07-000-048792-000004
Actv Date: 06-20-88

BRENTWOOD SHELL SERVICE (Continued) **S101623517**

Capacity: 500
Tank Use: OIL
Stg: W
Content: WASTE OIL
Number Of Tanks: Not reported

D12 **BRENTWOOD SHELL SERVICE** **HIST UST** **U001596329**
SSW **1355 HIGHWAY 4** **N/A**
1/8-1/4 **BRENTWOOD, CA 94513**
1114 ft.

Site 2 of 2 in cluster D

Relative:
Higher

Actual:
68 ft.

HIST UST:

Region: STATE
Facility ID: 00000048792
Tank Num: 001
Container Num: 1
Year Installed: 1945
Tank Capacity: 00000000
Facility Type: Gas Station
Other Type: Not reported
Total Tanks: 0004
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Tank Construction: 1/4 inches
Leak Detection: Stock Inventor
Contact Name: Not reported
Telephone: 4156348954
Owner Name: HUGO R. HENRIQUEZ
Owner Address: 1355 HIGHWAY 4
Owner City,St,Zip: BRENTWOOD, CA 94513

Region: STATE
Facility ID: 00000048792
Tank Num: 002
Container Num: 2
Year Installed: 1945
Tank Capacity: 00000000
Facility Type: Gas Station
Other Type: Not reported
Total Tanks: 0004
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Tank Construction: Not reported
Leak Detection: Stock Inventor
Contact Name: Not reported
Telephone: 4156348954
Owner Name: HUGO R. HENRIQUEZ
Owner Address: 1355 HIGHWAY 4
Owner City,St,Zip: BRENTWOOD, CA 94513

Region: STATE
Facility ID: 00000048792
Tank Num: 003
Container Num: 3
Year Installed: 1945
Tank Capacity: 00000000
Facility Type: Gas Station

BRENTWOOD SHELL SERVICE (Continued) **U001596329**

Other Type: Not reported
Total Tanks: 0004
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Tank Construction: Not reported
Leak Detection: Stock Inventor
Contact Name: Not reported
Telephone: 4156348954
Owner Name: HUGO R. HENRIQUEZ
Owner Address: 1355 HIGHWAY 4
Owner City,St,Zip: BRENTWOOD, CA 94513

Region: STATE
Facility ID: 00000048792
Tank Num: 004
Container Num: 4
Year Installed: 1945
Tank Capacity: 00000000
Facility Type: Gas Station
Other Type: Not reported
Total Tanks: 0004
Tank Used for: WASTE
Type of Fuel: WASTE OIL
Tank Construction: Not reported
Leak Detection: None
Contact Name: Not reported
Telephone: 4156348954
Owner Name: HUGO R. HENRIQUEZ
Owner Address: 1355 HIGHWAY 4
Owner City,St,Zip: BRENTWOOD, CA 94513

13
SSW
1/8-1/4
1168 ft.

BEACON STATION #544 **HIST UST** **U001596324**
1380 HIGHWAY 4 **N/A**
BRENTWOOD, CA 94513

Relative:
Higher

Actual:
68 ft.

HIST UST:
Region: STATE
Facility ID: 00000038853
Tank Num: 001
Container Num: #544-2
Year Installed: 1964
Tank Capacity: 00010000
Facility Type: Gas Station
Other Type: Not reported
Total Tanks: 0002
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Tank Construction: .025 inches
Leak Detection: Stock Inventor
Contact Name: PAT WATKINS
Telephone: 2095820241
Owner Name: BEACON OIL COMPANY
Owner Address: 525 W. THIRD STREET
Owner City,St,Zip: HANFORD, CA 93230

Region: STATE
Facility ID: 00000038853

BEACON STATION #544 (Continued) **U001596324**

Tank Num:	002
Container Num:	#544-3
Year Installed:	1964
Tank Capacity:	00008000
Facility Type:	Gas Station
Other Type:	Not reported
Total Tanks:	0002
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Tank Construction:	.025 inches
Leak Detection:	Stock Inventor
Contact Name:	PAT WATKINS
Telephone:	2095820241
Owner Name:	BEACON OIL COMPANY
Owner Address:	525 W. THIRD STREET
Owner City,St,Zip:	HANFORD, CA 93230

14
South
1/8-1/4
1211 ft.

BYER S AUTO BODY REPAIR
1377 HIGHWAY 4
BRENTWOOD, CA 94513

RCRA-SQG **1000352096**
FINDS **CAD027943125**
HAZNET

Relative:
Higher

Actual:
68 ft.

RCRAInfo:

Owner:	NOT REQUIRED (415) 555-1212
EPA ID:	CAD027943125
Contact:	Not reported
Classification:	Small Quantity Generator
TSDF Activities:	Not reported

Violation Status: Violations exist

Regulation Violated:	262.10-12.A
Area of Violation:	GENERATOR-ALL REQUIREMENTS (OVERSIGHT)
Date Violation Determined:	08/04/1992
Actual Date Achieved Compliance:	08/04/1997

There are 1 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Evaluation Inspection	GENERATOR-ALL REQUIREMENTS (OVERSIGHT)	19970804

FINDS:
Other Pertinent Environmental Activity Identified at Site

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:

Gepaid:	CAD027943125

BYER S AUTO BODY REPAIR (Continued) **1000352096**

Contact: HENRY J & JOSEPHINE VASQUEZ
Telephone: 9256252520
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 7911 BRENTWOOD BLVD
Mailing City,St,Zip: BRENTWOOD, CA 945131003
Gen County: 7
TSD EPA ID: CAD008252405
TSD County: Los Angeles
Waste Category: Not reported
Disposal Method: Recycler
Tons: 0
Facility County: 7

Gepaid: CAD027943125
Contact: HENRY J & JOSEPHINE VASQUEZ
Telephone: 9256252520
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 7911 BRENTWOOD BLVD
Mailing City,St,Zip: BRENTWOOD, CA 945131003
Gen County: 7
TSD EPA ID: CAD008252405
TSD County: Los Angeles
Waste Category: Unspecified solvent mixture Waste
Disposal Method: Recycler
Tons: 0.1042
Facility County: 7

Gepaid: CAD027943125
Contact: HENRY J & JOSEPHINE VASQUEZ
Telephone: 9256252520
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 7911 BRENTWOOD BLVD
Mailing City,St,Zip: BRENTWOOD, CA 945131003
Gen County: 7
TSD EPA ID: CAD009452657
TSD County: San Mateo
Waste Category: Not reported
Disposal Method: Recycler
Tons: 0
Facility County: 7

Gepaid: CAD027943125
Contact: HENRY J & JOSEPHINE VASQUEZ
Telephone: 9256252520
Facility Addr2: Not reported
Mailing Name: Not reported
Mailing Address: 7911 BRENTWOOD BLVD
Mailing City,St,Zip: BRENTWOOD, CA 945131003
Gen County: 7
TSD EPA ID: CAD009452657
TSD County: San Mateo
Waste Category: Unspecified solvent mixture Waste
Disposal Method: Recycler
Tons: 0.5794

BYER S AUTO BODY REPAIR (Continued) **1000352096**

Facility County:	7
Gepaid:	CAD027943125
Contact:	HENRY J & JOSEPHINE VASQUEZ
Telephone:	9256252520
Facility Addr2:	Not reported
Mailing Name:	Not reported
Mailing Address:	7911 BRENTWOOD BLVD
Mailing City,St,Zip:	BRENTWOOD, CA 945131003
Gen County:	7
TSD EPA ID:	CAD009452657
TSD County:	San Mateo
Waste Category:	Unspecified solvent mixture Waste
Disposal Method:	Recycler
Tons:	1.1755
Facility County:	7

Click this hyperlink while viewing on your computer to access
10 additional CA_HAZNET: record(s) in the EDR Site Report.

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15 **TOMRA PACIFIC INC/CENTRO MART** **SWRCY** **S107138006**
South **7820 BRENTWOOD BLVD** **N/A**
1/4-1/2 **BRENTWOOD, CA 94513**
1376 ft.

Relative:
Higher

Actual:
68 ft.

SWRCY:

Certification Status:	O
Facility Phone Number:	Not reported
Date facility became certified:	02/09/05
Date facility began operating:	03/05/05
Date facility ceased operating:	Still operating
Whether The Facility Is Grandfathered:	Not reported
Convenience Zone Where Faciltiy Located:	164
Convenience Zone Where Faciltiy Located 2:	165
Convenience Zone Where Faciltiy Located 3:	4002
Convenience Zone Where Faciltiy Located 4:	0
Convenience Zone Where Faciltiy Located 5:	0
Convenience Zone Where Faciltiy Located 6:	0
Convenience Zone Where Faciltiy Located 7:	0
Aluminum Beverage Containers Redeemed:	AL
Glass Beverage Containers Redeemed:	GL
Plastic Beverage Containers Redeemed:	PL
Other mat beverage containers redeemed:	Not reported
Refillable Beverage Containers Redeemed:	Not reported

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16 **SAVER'S SS** **LUST** **S101294066**
South **2323 HWY 4** **N/A**
1/4-1/2 **BRENTWOOD, CA 94513**
1600 ft.

Relative:
Higher

Actual:
68 ft.

LUST:

Region:	STATE
Case Type:	Soil only
Cross Street:	Not reported
Enf Type:	None Taken
Funding:	Not reported

SAVER'S SS (Continued) **S101294066**

How Discovered: Not reported
How Stopped: Not reported
Leak Cause: UNK
Leak Source: UNK
Global Id: T0601300755
Stop Date: Not reported
Confirm Leak: 1987-09-18 00:00:00
Workplan: Not reported
Prelim Assess: Not reported
Pollution Char: Not reported
Remed Plan: Not reported
Remed Action: Not reported
Monitoring: Not reported
Close Date: 1997-12-02 00:00:00
Discover Date: Not reported
Enforcement Dt: 1965-01-01 00:00:00
Release Date: 1987-09-17 00:00:00
Review Date: 1997-12-02 00:00:00
Enter Date: 1988-06-23 00:00:00
MTBE Date: Not reported
GW Qualifier: Not reported
Soil Qualifier: Not reported
Max MTBE GW ppb: Not reported
Max MTBE Soil ppb: Not reported
County: 07
Org Name: Not reported
Reg Board: 5S
Status: Case Closed
Chemical: Gasoline
Contact Person: Not reported
Responsible Party: SAVER'S GAS
RP Address: Not reported
Interim: Not reported
Oversight Prgm: LUST
MTBE Class: *
MTBE Conc: 0
MTBE Fuel: 1
MTBE Tested: Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
Staff: PMV
Staff Initials: BRU
Lead Agency: Regional Board
Local Agency: 07000
Hydr Basin #: SAN JOAQUIN VALLEY (
Beneficial: Not reported
Priority: 2
Cleanup Fund Id: Not reported
Work Suspended: No
Local Case #: Not reported
Case Number: 070018
Qty Leaked: Not reported
Abate Method: Not reported
Operator: Not reported
Water System Name: SAVERS SWS
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: W0601307535
Waste Disch Assigned Name: 0707535-001GEN

SAVER'S SS (Continued) **S101294066**

Summary: BETWEEN AUG'87 & SEP'96, SIX UST'S WERE REMOVED. OVER THRITY SOIL SAMPLES WERE TAKEN. SOIL OVEREXCAVATED AND TREATED ON SITE. LATER USED TO FILL PITS. TPH-D FOUND AT 22 MG/KG. GW NOT ENCOUNTERED.....

LUST:

Region:	5
Case Number:	070018
Staff Initials:	PMV
Substance:	GASOLINE
Case Type:	Soil only
Status:	Case Closed
Lead Agency:	Regional
Program:	LUST
MTBE Code:	N/A

17
South
1/4-1/2
2007 ft.

BEACON STATION #544
7920 BRENTWOOD BLVD
BRENTWOOD, CA 94513

LUST **S101581093**
Cortese **N/A**
CA FID UST
SWEEPS UST

Relative:
Higher

Actual:
68 ft.

LUST:

Region:	STATE
Case Type:	Drinking Water Aquifer affected
Cross Street:	Not reported
Enf Type:	TC
Funding:	Not reported
How Discovered:	Not reported
How Stopped:	Not reported
Leak Cause:	UNK
Leak Source:	UNK
Global Id:	T0601300802
Stop Date:	Not reported
Confirm Leak:	Not reported
Workplan:	1997-12-03 00:00:00
Prelim Assess:	Not reported
Pollution Char:	Not reported
Remed Plan:	Not reported
Remed Action:	Not reported
Monitoring:	Not reported
Close Date:	Not reported
Discover Date:	1997-12-03 00:00:00
Enforcement Dt:	2000-10-10 00:00:00
Release Date:	1997-12-03 00:00:00
Review Date:	2001-10-12 00:00:00
Enter Date:	1997-12-03 00:00:00
MTBE Date:	2000-06-12 00:00:00
GW Qualifier:	=
Soil Qualifier:	Not reported
Max MTBE GW ppb:	560.00
Max MTBE Soil ppb:	Not reported
County:	07
Org Name:	Not reported
Reg Board:	5S
Status:	Preliminary site assessment workplan submitted
Chemical:	Gasoline
Contact Person:	Not reported
Responsible Party:	ULTRAMAR INC

BEACON STATION #544 (Continued) **S101581093**

RP Address: 525 W 3RD ST, HANFORD, CA 93230
Interim: Not reported
Oversight Prgm: LUST
MTBE Class: A
MTBE Conc: 8
MTBE Fuel: 1
MTBE Tested: MTBE Detected. Site tested for MTBE and MTBE detected
Staff: PMV
Staff Initials: BRU
Lead Agency: Regional Board
Local Agency: 07000
Hydr Basin #: SAN JOAQUIN VALLEY (
Beneficial: Not reported
Priority: 1
Cleanup Fund Id: Not reported
Work Suspended: No
Local Case #: Not reported
Case Number: 070084
Qty Leaked: Not reported
Abate Method: Not reported
Operator: Not reported
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported
Summary: Not reported

LUST:
Region: 5
Case Number: 070084
Staff Initials: PMV
Substance: GASOLINE
Case Type: Drinking Water Aquifer affected
Status: Preliminary site assessment workplan submitted
Lead Agency: Regional
Program: LUST
MTBE Code: 5

Cortese:
Region: CORTESE
Facility Addr2: 7920 BRENTWOOD BLVD

CA FID UST:
Facility ID: 07001385
Regulated By: UTNKA
Regulated ID: Not reported
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 4156341515
Mail To: Not reported
Mailing Address: 525 W 003RD ST
Mailing Address 2: Not reported
Mailing City,St,Zip: BRENTWOOD 94513
Contact: Not reported
Contact Phone: Not reported

BEACON STATION #544 (Continued) **S101581093**

DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

SWEEPS UST:
Status: A
Comp Number: 38853
Number: 1
Board Of Equalization: 44-000030
Ref Date: 01-31-92
Act Date: 01-31-92
Created Date: 07-22-88
Tank Status: A
Owner Tank Id: 544-3
Swrcb Tank Id: 07-000-038853-000001
Actv Date: 01-31-92
Capacity: 10000
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: 3

Status: A
Comp Number: 38853
Number: 1
Board Of Equalization: 44-000030
Ref Date: 01-31-92
Act Date: 01-31-92
Created Date: 07-22-88
Tank Status: A
Owner Tank Id: 544-1
Swrcb Tank Id: 07-000-038853-000002
Actv Date: 01-31-92
Capacity: 8000
Tank Use: M.V. FUEL
Stg: P
Content: REG UNLEADED
Number Of Tanks: Not reported

Status: A
Comp Number: 38853
Number: 1
Board Of Equalization: 44-000030
Ref Date: 01-31-92
Act Date: 01-31-92
Created Date: 07-22-88
Tank Status: A
Owner Tank Id: 544-2
Swrcb Tank Id: 07-000-038853-000003
Actv Date: 01-31-92
Capacity: 8000
Tank Use: M.V. FUEL
Stg: P
Content: LEADED
Number Of Tanks: Not reported

18 NE 1/4-1/2 2173 ft. | **BRENTWOOD SOLID WASTE TRANSFER STATION** | **SWF/LF** | **S102859134** | **N/A**
2300 ELKINS WAY
BRENTWOOD, CA

Relative: Lower

Actual: 55 ft.

LF:

Region:	STATE
Facility ID:	07-AA-0053
Facility Telephone:	Not reported
Facility Telephone 2:	Not reported
Lat/Long:	37.96619 / -122.37101
Land Owner:	Not reported
Owner Name:	City Of Brentwood, Public Sevice Dept.
Owner Telephone:	5086347098
Owner Address:	Not reported
Owner Address2:	708 Third Street
Owner City,St,Zip:	Brentwood, CA 94513
Operator:	City Of Brentwood, Public Sevice Dept.
Operator Phone:	5086347098
Operator Address:	Not reported
Operator Address2:	708 Third Street
Operator City,St,Zip:	Brentwood, CA 94513
Operator's Status:	Active
Permit Date:	3/28/2000
Permit Status:	Permitted
Permitted Acreage:	2.00
Activity:	Large Volume Transfer/Proc Facility
Regulation Status:	Permitted
Land Use:	Not reported
Landuse Name:	Not reported
GIS Source:	Map
Category:	Transfer/Processing
Unit Number:	01
Inspection Frequency:	Monthly
Accepted Waste:	Mixed municipal
Year Opened:	Not reported
Year Closed:	Not reported
Closure Date:	/ /
Closure Type:	Not reported
Closure Approve:	Not reported
Disposal Acreage:	Not reported
Status:	Not reported
Swisnumber:	Not reported
Aka:	Not reported
Type Of Waste:	Not reported
Disposal Area:	Not reported
SWFP Date:	Not reported
WDR Number:	Not reported
Dates Operation:	Not reported
Dt Of Field Units:	Not reported
Surface Condition:	Not reported
Landfill Gas:	Not reported
Leachate:	Not reported
Emrgncy Response:	Not reported
Lea Date:	Not reported
Restrictions:	Not reported
Fill Area:	Not reported
Type Of Refuse:	Not reported
Avg Depth Of Fill:	Not reported

BRENTWOOD SOLID WASTE TRANSFER STATION (Continued) **S102859134**

Addtl Expansion Area:	Not reported
Site Size:	Not reported
Site Type:	Not reported
Site Description:	Not reported
Reassess Site:	Not reported
Location:	Not reported
Parcel Num:	Not reported
Issue & Observations:	Not reported
Other Observations:	Not reported
Date:	Not reported
Address:	Not reported
Prep By:	Not reported
DOHS Number:	Not reported
CUP Number:	Not reported
CIWMB:	Not reported
Program Type:	Not reported
Public Notice:	Not reported
PERMTIER:	Not reported
Recommendations:	Not reported
Othr Recommendation:	Not reported
Sig. Change Since Last Visit:	Not reported
Priority For Site Assessment:	Not reported
Permitted Throughput with Units:	400
Actual Throughput with Units:	Tons/day
Permitted Capacity with Units:	400
Remaining Capacity:	Not reported
Remaining Capacity with Units:	Tons/day
Last Waste Tire Inspection Count:	Not reported
Last Waste Tire Inspection Date:	Not reported
Original Waste Tire Count:	Not reported
Original Waste Tire Count Date:	Not reported

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BRENTWOOD	S101580870	NORMAN'S BRENTWOOD NURSERY	RR 3 BOX 526 HWY 4	94513	CA FID UST, CONTRA COSTA CO. SITE LIST, SWEEPS UST
BRENTWOOD	S101580795	SAVERS GAS	2323 HIGHWAY 4	94513	CA FID UST, SWEEPS UST
BRENTWOOD	S101623515	BILL BRANDT FORD, INC.	1245 HIGHWAY 4	94513	CA FID UST, CONTRA COSTA CO. SITE LIST, SWEEPS UST
BRENTWOOD	S102260089	CAL TRANS HIGHWAY WIDENING	HWY 4 / SPRUCE	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S103464211	MARSH CREEK #2 DEHYDRATION STATION	HWY 4 / SUNSET RD	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S105022926	BLUE GOOSE PROPERTIES	380 HWY 4 S	94513	LUST, Cortese
BRENTWOOD	S106925285	DELTA FENCE CO., INC.	HIGHWAY 4	94513	SWEEPS UST
BRENTWOOD	U001596363	MANGINI BROS	HIGHWAY 4	94513	HIST UST, SWEEPS UST
BRENTWOOD	U003784124	MANGINI BROS	HWY 4	94513	UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260066	SHIROYAMA FARM	BRENTWOOD BLVD	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S106928458	LADD, L. JORDAN	BYRON HIGHWAY AT	94513	SWEEPS UST
BRENTWOOD	U001596356	L. JORDAN LADD	BYRON HIGHWAY AT	94513	HIST UST
BRENTWOOD	U003784169	LADD, L. JORDAN	BYRON HWY	94513	UST, CONTRA COSTA CO. SITE LIST
BRENTWOOD	S107591811	ZORIA FARMS, INC	12250 BYRON HWY		CONTRA COSTA CO. SITE LIST
BRENTWOOD	S101581132	CHEAPER! #151	LONE TREE WAY/HWY 4	94513	CA FID UST, CONTRA COSTA CO. SITE LIST, SWEEPS UST
BRENTWOOD	S106924253	CHEAPERI #151	LONE TREE WAY/HWY 4	94513	SWEEPS UST
BRENTWOOD	S103172139	EOG RESOURCES, INC	SAND CREEK RD	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	U001596327	BRENTWOOD PRODUCTION YARD	SAND CREEK RD.	94513	HIST UST
BRENTWOOD	S102260139	NICHOLSON COMPANY	SPRUCE AVE / HWY 4	94513	CONTRA COSTA CO. SITE LIST
BRENTWOOD	S102260121	BETTENCOURT, EVELYN T	RT 1, BOX 116	94513	CONTRA COSTA CO. SITE LIST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/20/2007
Date Data Arrived at EDR: 05/03/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 63

Source: EPA
Telephone: N/A
Last EDR Contact: 07/31/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/20/2007
Date Data Arrived at EDR: 05/03/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 63

Source: EPA
Telephone: N/A
Last EDR Contact: 08/03/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/20/2007
Date Data Arrived at EDR: 05/03/2007
Date Made Active in Reports: 06/25/2007
Number of Days to Update: 53

Source: EPA
Telephone: N/A
Last EDR Contact: 08/03/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: No Update Planned

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/27/2007
Date Data Arrived at EDR: 03/21/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 37

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 06/20/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 03/21/2007
Date Data Arrived at EDR: 04/27/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 28

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 06/15/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/14/2007
Date Data Arrived at EDR: 03/20/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 38

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/13/2006
Date Data Arrived at EDR: 06/28/2006
Date Made Active in Reports: 08/23/2006
Number of Days to Update: 56

Source: EPA
Telephone: (415) 495-8895
Last EDR Contact: 07/16/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Quarterly

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 01/24/2007
Date Made Active in Reports: 03/12/2007
Number of Days to Update: 47

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 07/23/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/05/2007
Date Data Arrived at EDR: 04/17/2007
Date Made Active in Reports: 05/14/2007
Number of Days to Update: 27

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 07/18/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Annually

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 04/20/2007
Date Data Arrived at EDR: 04/26/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 29

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 04/20/2007
Date Data Arrived at EDR: 04/26/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 29

Source: Environmental Protection Agency
Telephone: 703-603-8905
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 08/09/2007
Next Scheduled EDR Contact: 11/05/2007
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 09/20/2006
Date Made Active in Reports: 11/22/2006
Number of Days to Update: 63

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/13/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 04/04/2007
Date Data Arrived at EDR: 04/04/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 51

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/11/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 08/23/2006
Date Data Arrived at EDR: 03/06/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 35

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/24/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 03/27/2007
Date Data Arrived at EDR: 03/27/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 31

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/08/2006
Date Made Active in Reports: 01/29/2007
Number of Days to Update: 82

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 07/05/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 04/27/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 69

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 06/19/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002
Date Data Arrived at EDR: 04/14/2006
Date Made Active in Reports: 05/30/2006
Number of Days to Update: 46

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 07/30/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/13/2007
Date Data Arrived at EDR: 04/25/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 71

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 06/15/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/13/2007
Date Data Arrived at EDR: 04/25/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 71

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 06/15/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Quarterly

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/13/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 45

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/16/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Annually

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 03/08/2007
Date Data Arrived at EDR: 04/12/2007
Date Made Active in Reports: 05/14/2007
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 05/01/2007
Date Data Arrived at EDR: 05/03/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 22

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 08/01/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/01/2006
Date Data Arrived at EDR: 01/08/2007
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 3

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 06/29/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 06/15/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: No Update Planned

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 02/21/2007
Date Data Arrived at EDR: 04/03/2007
Date Made Active in Reports: 05/14/2007
Number of Days to Update: 41

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 06/22/2007
Next Scheduled EDR Contact: 07/16/2007
Data Release Frequency: Quarterly

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 06/11/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 05/14/2007
Date Data Arrived at EDR: 05/30/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 36

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/30/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Varies

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 10/17/2006
Date Data Arrived at EDR: 11/29/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 43

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 08/09/2007
Next Scheduled EDR Contact: 11/05/2007
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/05/2007
Date Data Arrived at EDR: 04/25/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 30

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/06/2007
Date Data Arrived at EDR: 03/28/2007
Date Made Active in Reports: 05/14/2007
Number of Days to Update: 47

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/28/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/12/2007
Date Data Arrived at EDR: 05/17/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 49

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/06/2007
Date Made Active in Reports: 04/13/2007
Number of Days to Update: 38

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 06/12/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Biennially

USGS WATER WELLS: National Water Information System (NWIS)

This database consists of well records in the United States. Available site descriptive information includes well location information (latitude and longitude, well depth, site use, water use, and aquifer).

Date of Government Version: 03/25/2005
Date Data Arrived at EDR: 03/25/2005
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: USGS
Telephone: N/A
Last EDR Contact: 03/25/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: N/A

PWS: Public Water System Data

This Safe Drinking Water Information System (SDWIS) file contains public water systems name and address, population served and the primary source of water

Date of Government Version: 02/24/2000
Date Data Arrived at EDR: 04/27/2005
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: EPA
Telephone: N/A
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STATE AND LOCAL RECORDS

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 05/25/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: No Update Planned

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 05/29/2007
Date Data Arrived at EDR: 05/30/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 30

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/30/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 07/30/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: No Update Planned

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 06/11/2007
Date Data Arrived at EDR: 06/13/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 16

Source: Integrated Waste Management Board
Telephone: 916-341-6320
Last EDR Contact: 06/13/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Quarterly

CA WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 06/20/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Quarterly

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites). This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 05/29/2001
Date Made Active in Reports: 07/26/2001
Number of Days to Update: 58

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 07/23/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 07/09/2007
Date Data Arrived at EDR: 07/11/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 29

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 07/11/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 07/16/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/06/2007
Next Scheduled EDR Contact: 11/05/2007
Data Release Frequency: Varies

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2007
Date Data Arrived at EDR: 08/01/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 8

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 08/01/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 06/25/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 08/13/2007
Next Scheduled EDR Contact: 11/12/2007
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Quarterly

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 07/10/2007
Date Data Arrived at EDR: 07/11/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 29

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 07/11/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 08/03/2007
Date Data Arrived at EDR: 08/03/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 6

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 08/03/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 08/13/2007
Next Scheduled EDR Contact: 11/12/2007
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/23/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 07/17/2007
Date Data Arrived at EDR: 07/18/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 22

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 07/17/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 03/13/2007
Date Data Arrived at EDR: 03/14/2007
Date Made Active in Reports: 04/06/2007
Number of Days to Update: 23

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 06/29/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Annually

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 07/10/2007
Date Data Arrived at EDR: 07/11/2007
Date Made Active in Reports: 07/25/2007
Number of Days to Update: 14

Source: SWRCB
Telephone: 916-480-1028
Last EDR Contact: 07/11/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Semi-Annually

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 06/25/2007
Date Data Arrived at EDR: 06/26/2007
Date Made Active in Reports: 07/25/2007
Number of Days to Update: 29

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 06/25/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Varies

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 05/07/2007
Date Data Arrived at EDR: 05/08/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 17

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/06/2007
Next Scheduled EDR Contact: 11/05/2007
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
Registered Aboveground Storage Tanks.

Date of Government Version: 05/01/2007
Date Data Arrived at EDR: 05/01/2007
Date Made Active in Reports: 05/25/2007
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 916-341-5712
Last EDR Contact: 07/30/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Quarterly

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1980's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/23/2007
Date Made Active in Reports: 04/06/2007
Number of Days to Update: 42

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

NOTIFY 65: Proposition 65 Records

Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 07/16/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: No Update Planned

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 07/02/2007
Date Data Arrived at EDR: 07/03/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 37

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/03/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Semi-Annually

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 05/29/2007
Date Data Arrived at EDR: 05/30/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 30

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/30/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 07/31/2007
Date Data Arrived at EDR: 07/31/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 9

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 07/30/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 03/01/2007
Date Data Arrived at EDR: 03/13/2007
Date Made Active in Reports: 04/06/2007
Number of Days to Update: 24

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 07/27/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Varies

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 03/07/2007
Date Made Active in Reports: 04/06/2007
Number of Days to Update: 30

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 07/23/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Varies

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 05/29/2007
Date Data Arrived at EDR: 05/30/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 30

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/30/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Quarterly

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/20/2006
Date Made Active in Reports: 01/03/2007
Number of Days to Update: 44

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 08/09/2007
Next Scheduled EDR Contact: 11/05/2007
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 04/17/2007
Date Made Active in Reports: 05/10/2007
Number of Days to Update: 23

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 07/20/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Varies

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 06/07/2007
Date Data Arrived at EDR: 06/08/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 21

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/11/2007
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

ENVIROSTOR: EnviroStor Database
The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 05/29/2007
Date Data Arrived at EDR: 05/30/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 30

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/30/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Quarterly

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 08/09/2007
Next Scheduled EDR Contact: 11/05/2007
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 12/01/2006
Date Data Arrived at EDR: 12/01/2006
Date Made Active in Reports: 01/29/2007
Number of Days to Update: 59

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 06/01/2007
Date Data Arrived at EDR: 06/14/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 21

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 01/04/2005
Date Data Arrived at EDR: 01/21/2005
Date Made Active in Reports: 02/28/2005
Number of Days to Update: 38

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 03/20/2007
Date Data Arrived at EDR: 04/16/2007
Date Made Active in Reports: 05/14/2007
Number of Days to Update: 28

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Semi-Annually

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/30/2007
Date Data Arrived at EDR: 05/31/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 35

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/23/2007
Date Data Arrived at EDR: 05/24/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 42

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 06/18/2007
Date Data Arrived at EDR: 06/18/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land

Date of Government Version: 06/06/2007
Date Data Arrived at EDR: 06/07/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 28

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

Date of Government Version: 06/01/2007
Date Data Arrived at EDR: 06/14/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 21

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

Date of Government Version: 03/20/2007
Date Data Arrived at EDR: 04/16/2007
Date Made Active in Reports: 05/14/2007
Number of Days to Update: 28

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Semi-Annually

INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 06/18/2007
Date Data Arrived at EDR: 06/18/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 17

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land
A listing of underground storage tank locations on Indian Land.

Date of Government Version: 12/01/2006
Date Data Arrived at EDR: 12/01/2006
Date Made Active in Reports: 01/29/2007
Number of Days to Update: 59

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 12/02/2004
Date Data Arrived at EDR: 12/29/2004
Date Made Active in Reports: 02/04/2005
Number of Days to Update: 37

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

Date of Government Version: 05/30/2007
Date Data Arrived at EDR: 05/31/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 35

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 05/23/2007
Date Data Arrived at EDR: 05/24/2007
Date Made Active in Reports: 07/05/2007
Number of Days to Update: 42

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Quarterly

EDR PROPRIETARY RECORDS

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 04/24/2007
Date Data Arrived at EDR: 04/26/2007
Date Made Active in Reports: 05/10/2007
Number of Days to Update: 14

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/23/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/24/2007
Date Data Arrived at EDR: 04/26/2007
Date Made Active in Reports: 05/07/2007
Number of Days to Update: 11

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 07/23/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/29/2007
Date Data Arrived at EDR: 05/31/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 29

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 05/29/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Semi-Annually

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/16/2007
Date Data Arrived at EDR: 07/17/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 23

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 08/06/2007
Next Scheduled EDR Contact: 11/05/2007
Data Release Frequency: Semi-Annually

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 06/20/2007
Date Data Arrived at EDR: 06/21/2007
Date Made Active in Reports: 07/25/2007
Number of Days to Update: 34

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 06/18/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 07/07/1999
Date Made Active in Reports: N/A
Number of Days to Update: 0

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 07/16/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/31/2007
Date Data Arrived at EDR: 04/12/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 15

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 08/13/2007
Next Scheduled EDR Contact: 11/12/2007
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 05/15/2007
Date Data Arrived at EDR: 06/08/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 21

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 05/16/2007
Next Scheduled EDR Contact: 08/13/2007
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/01/2007
Date Data Arrived at EDR: 03/27/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 31

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 06/11/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 05/30/2007
Date Data Arrived at EDR: 07/11/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 29

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 08/13/2007
Next Scheduled EDR Contact: 11/12/2007
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 05/14/2007
Date Data Arrived at EDR: 05/15/2007
Date Made Active in Reports: 06/25/2007
Number of Days to Update: 41

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 08/13/2007
Next Scheduled EDR Contact: 11/12/2007
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 05/30/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 05/29/2007
Date Data Arrived at EDR: 05/29/2007
Date Made Active in Reports: 06/25/2007
Number of Days to Update: 27

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 08/13/2007
Next Scheduled EDR Contact: 11/12/2007
Data Release Frequency: Semi-Annually

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 05/08/2007
Date Data Arrived at EDR: 06/08/2007
Date Made Active in Reports: 07/25/2007
Number of Days to Update: 47

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 07/30/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Semi-Annually

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 07/24/2007
Date Data Arrived at EDR: 07/27/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 13

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 07/24/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Semi-Annually

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 04/09/2007
Date Data Arrived at EDR: 04/10/2007
Date Made Active in Reports: 04/24/2007
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 07/24/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Annually

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 06/01/2007
Date Data Arrived at EDR: 06/19/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 10

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 06/06/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 06/01/2007
Date Data Arrived at EDR: 06/19/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 10

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 06/06/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities

Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 06/01/2007
Date Data Arrived at EDR: 06/19/2007
Date Made Active in Reports: 07/25/2007
Number of Days to Update: 36

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 06/06/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities

List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 07/23/2007
Date Data Arrived at EDR: 07/23/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 17

Source: Placer County Health and Human Services
Telephone: 530-889-7312
Last EDR Contact: 06/18/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/21/2007
Date Data Arrived at EDR: 05/22/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 38

Source: Department of Public Health
Telephone: 951-358-5055
Last EDR Contact: 07/16/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Quarterly

Underground Storage Tank Tank List

Underground storage tank sites located in Riverside county.

Date of Government Version: 05/21/2007
Date Data Arrived at EDR: 05/22/2007
Date Made Active in Reports: 06/25/2007
Number of Days to Update: 34

Source: Health Services Agency
Telephone: 951-358-5055
Last EDR Contact: 07/16/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Contaminated Sites

List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/04/2007
Date Data Arrived at EDR: 05/23/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 37

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/31/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Quarterly

ML - Regulatory Compliance Master List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/04/2007
Date Data Arrived at EDR: 05/24/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 36

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/31/2007
Next Scheduled EDR Contact: 10/29/2007
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 06/27/2007
Date Data Arrived at EDR: 06/29/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 41

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 05/16/2005
Date Data Arrived at EDR: 05/18/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 29

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 07/05/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 11/01/2006
Date Data Arrived at EDR: 01/03/2007
Date Made Active in Reports: 01/24/2007
Number of Days to Update: 21

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 06/27/2007
Date Data Arrived at EDR: 07/20/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 20

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 07/03/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Varies

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 06/08/2007
Date Data Arrived at EDR: 06/12/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 17

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 06/08/2007
Date Data Arrived at EDR: 06/12/2007
Date Made Active in Reports: 07/25/2007
Number of Days to Update: 43

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST

A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 04/06/2007
Date Data Arrived at EDR: 04/10/2007
Date Made Active in Reports: 04/24/2007
Number of Days to Update: 14

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 07/30/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Semi-Annually

SAN MATEO COUNTY:

Business Inventory

List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 07/30/2007
Date Data Arrived at EDR: 07/30/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 10

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Annually

Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 07/09/2007
Date Data Arrived at EDR: 07/10/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 30

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Semi-Annually

SANTA CLARA COUNTY:

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 06/25/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/26/2007
Date Data Arrived at EDR: 03/27/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 31

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 06/25/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Varies

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 06/11/2007
Date Data Arrived at EDR: 06/12/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 17

Source: City of San Jose Fire Department
Telephone: 408-277-4659
Last EDR Contact: 06/04/2007
Next Scheduled EDR Contact: 09/03/2007
Data Release Frequency: Annually

SOLANO COUNTY:

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 07/09/2007
Date Data Arrived at EDR: 08/03/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 6

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Quarterly

Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 03/26/2007
Date Data Arrived at EDR: 04/18/2007
Date Made Active in Reports: 05/07/2007
Number of Days to Update: 19

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 09/24/2007
Data Release Frequency: Quarterly

SONOMA COUNTY:

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/09/2007
Date Data Arrived at EDR: 07/09/2007
Date Made Active in Reports: 08/09/2007
Number of Days to Update: 31

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 10/22/2007
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 05/04/2007
Date Data Arrived at EDR: 05/04/2007
Date Made Active in Reports: 05/24/2007
Number of Days to Update: 20

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 07/02/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Semi-Annually

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 05/30/2007
Date Data Arrived at EDR: 06/22/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 7

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/12/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 08/01/2006
Date Data Arrived at EDR: 09/05/2006
Date Made Active in Reports: 10/05/2006
Number of Days to Update: 30

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/21/2007
Next Scheduled EDR Contact: 08/20/2007
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 06/05/2007
Date Data Arrived at EDR: 06/21/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 8

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/12/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 03/28/2007
Date Data Arrived at EDR: 04/24/2007
Date Made Active in Reports: 05/07/2007
Number of Days to Update: 13

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/11/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 04/30/2007
Date Data Arrived at EDR: 05/15/2007
Date Made Active in Reports: 06/25/2007
Number of Days to Update: 41

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 07/30/2007
Next Scheduled EDR Contact: 10/15/2007
Data Release Frequency: Annually

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 04/07/2006
Number of Days to Update: 49

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 06/13/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 04/01/2007
Date Data Arrived at EDR: 04/05/2007
Date Made Active in Reports: 05/08/2007
Number of Days to Update: 33

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/03/2007
Next Scheduled EDR Contact: 10/01/2007
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 10/26/2006
Date Data Arrived at EDR: 11/29/2006
Date Made Active in Reports: 01/05/2007
Number of Days to Update: 37

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 06/01/2007
Next Scheduled EDR Contact: 08/27/2007
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 06/06/2006
Number of Days to Update: 81

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/11/2007
Next Scheduled EDR Contact: 09/10/2007
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 04/09/2007
Date Data Arrived at EDR: 04/12/2007
Date Made Active in Reports: 04/27/2007
Number of Days to Update: 15

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 06/18/2007
Next Scheduled EDR Contact: 09/17/2007
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 04/27/2007
Date Made Active in Reports: 06/08/2007
Number of Days to Update: 42

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 07/09/2007
Next Scheduled EDR Contact: 10/08/2007
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

274250
APN #016-170-010
BRENTWOOD, CA 94513

TARGET PROPERTY COORDINATES

Latitude (North):	37.94720 - 37˚ 56' 49.9''
Longitude (West):	121.6934 - 121˚ 41' 36.2''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	614803.5
UTM Y (Meters):	4200556.5
Elevation:	61 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	37121-H6 BRENTWOOD, CA
Most Recent Revision:	1978

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

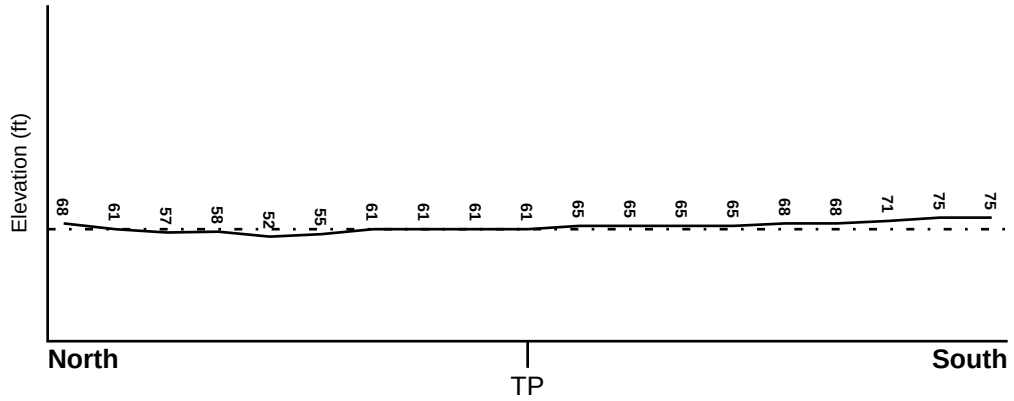
TOPOGRAPHIC INFORMATION

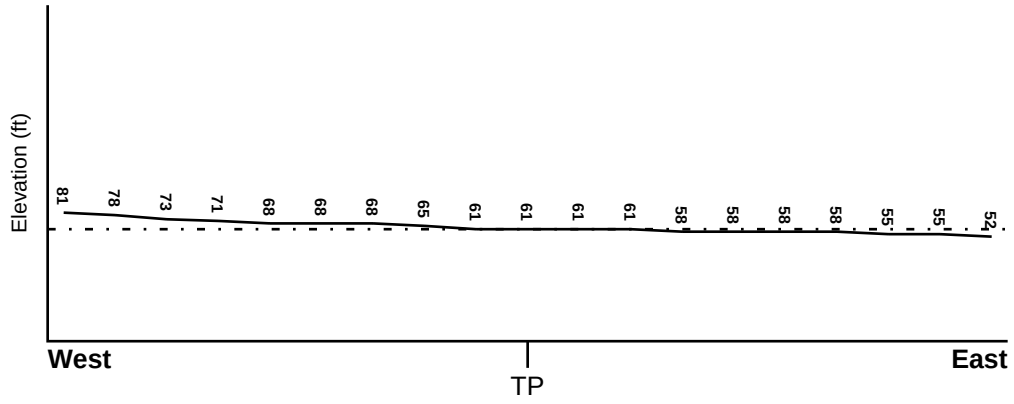
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

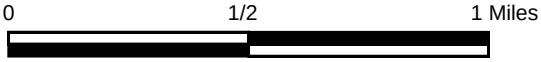
General Topographic Gradient: General NE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 61 ft.



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
CONTRA COSTA, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 0604390355B

Additional Panels in search area: 0600250355B
0600250360B
0604390360B
0600250365B
0604390365B
0600250370B

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
BRENTWOOD	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

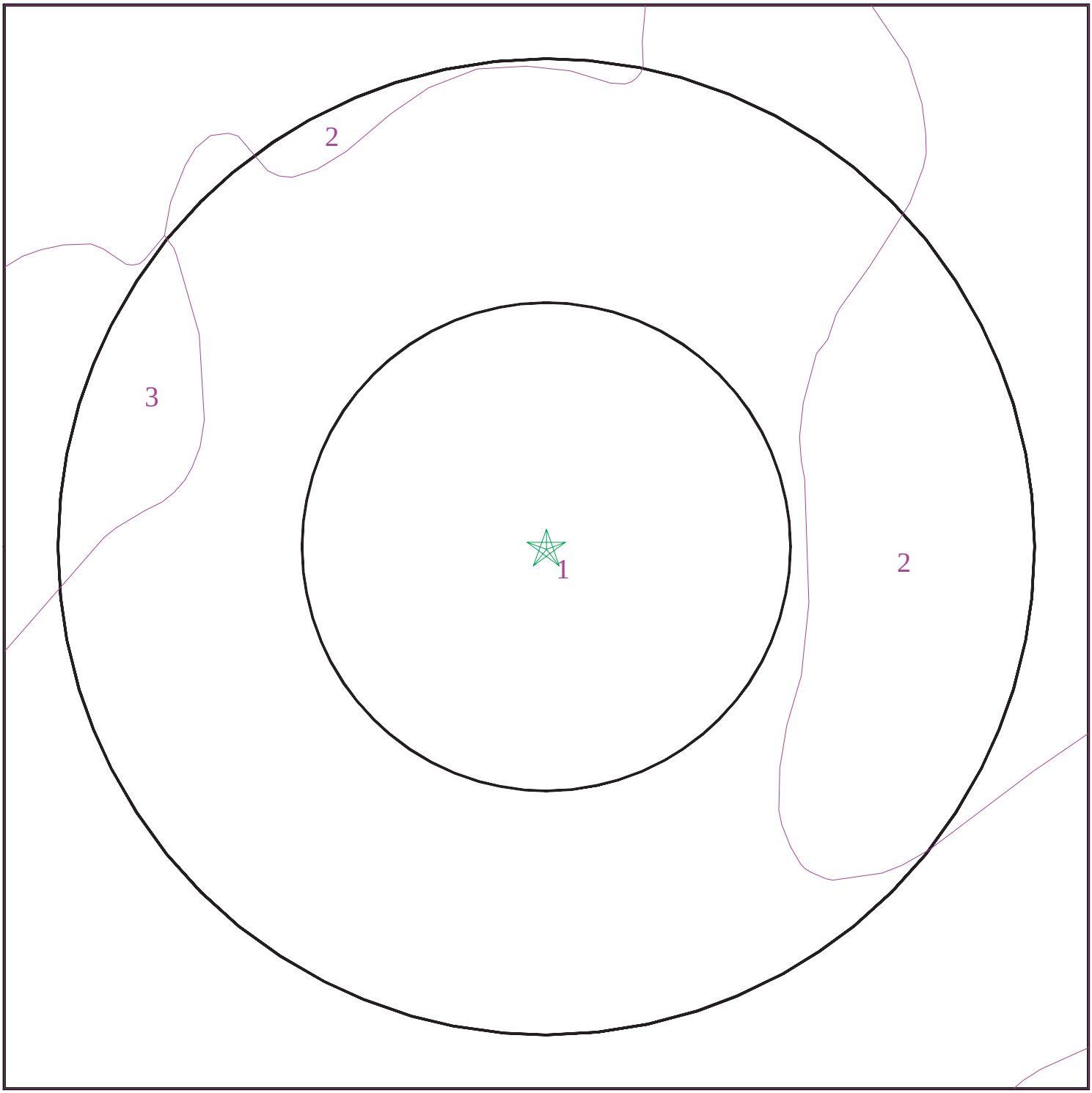
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 2003264.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME: 274250 ADDRESS: APN #016-170-010 Brentwood CA 94513 LAT/LONG: 37.9472 / 121.6934	CLIENT: AEI Consultants CONTACT: Keri Robinson INQUIRY #: 2003264.2s DATE: August 13, 2007 1:56 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: BRENTWOOD

Soil Surface Texture: clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 0 inches

Depth to Bedrock Max: > 0 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	46 inches	muck	Not reported	Highly organic soils, Peat.	Max: 6.00 Min: 0.20	Max: 4.40 Min: 2.00
1	0 inches	18 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 8.40 Min: 6.60
2	18 inches	50 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 8.40 Min: 6.60
2	46 inches	65 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 5.50 Min: 3.50

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
3	50 inches	60 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 8.40 Min: 7.40

Soil Map ID: 2

Soil Component Name: CAPAY

Soil Surface Texture: clay

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Moderately well drained. Soils have a layer of low hydraulic conductivity, wet state high in the profile. Depth to water table is 3 to 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 0 inches

Depth to Bedrock Max: > 0 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	18 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 6.00 Min: 4.50
1	0 inches	18 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 6.00 Min: 4.50

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	36 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.20 Min: 0.06	Max: 8.40 Min: 6.60
2	18 inches	48 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50
2	18 inches	48 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 6.00 Min: 4.50
2	36 inches	51 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.20 Min: 0.06	Max: 8.40 Min: 6.60
3	48 inches	60 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 20.00 Min: 2.00	Max: 6.00 Min: 4.50

Soil Map ID: 3

Soil Component Name: SYCAMORE

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Poorly. Soils may have a saturated zone, a layer of low hydraulic conductivity, or seepage. Depth to water table is less than 1 foot.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Soil meets the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 0 inches

Depth to Bedrock Max: > 0 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	15 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 7.30 Min: 6.60
2	15 inches	40 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 8.40 Min: 6.60
3	40 inches	60 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.20 Min: 0.06	Max: 8.40 Min: 6.60

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
3	USGS3222019	1/2 - 1 Mile West
4	USGS3221810	1/2 - 1 Mile WNW
A6	USGS3221839	1/2 - 1 Mile NNW
A8	USGS3221841	1/2 - 1 Mile NNW
9	USGS3221837	1/2 - 1 Mile NNW
13	USGS3221946	1/2 - 1 Mile SSW
14	USGS3221986	1/2 - 1 Mile WSW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

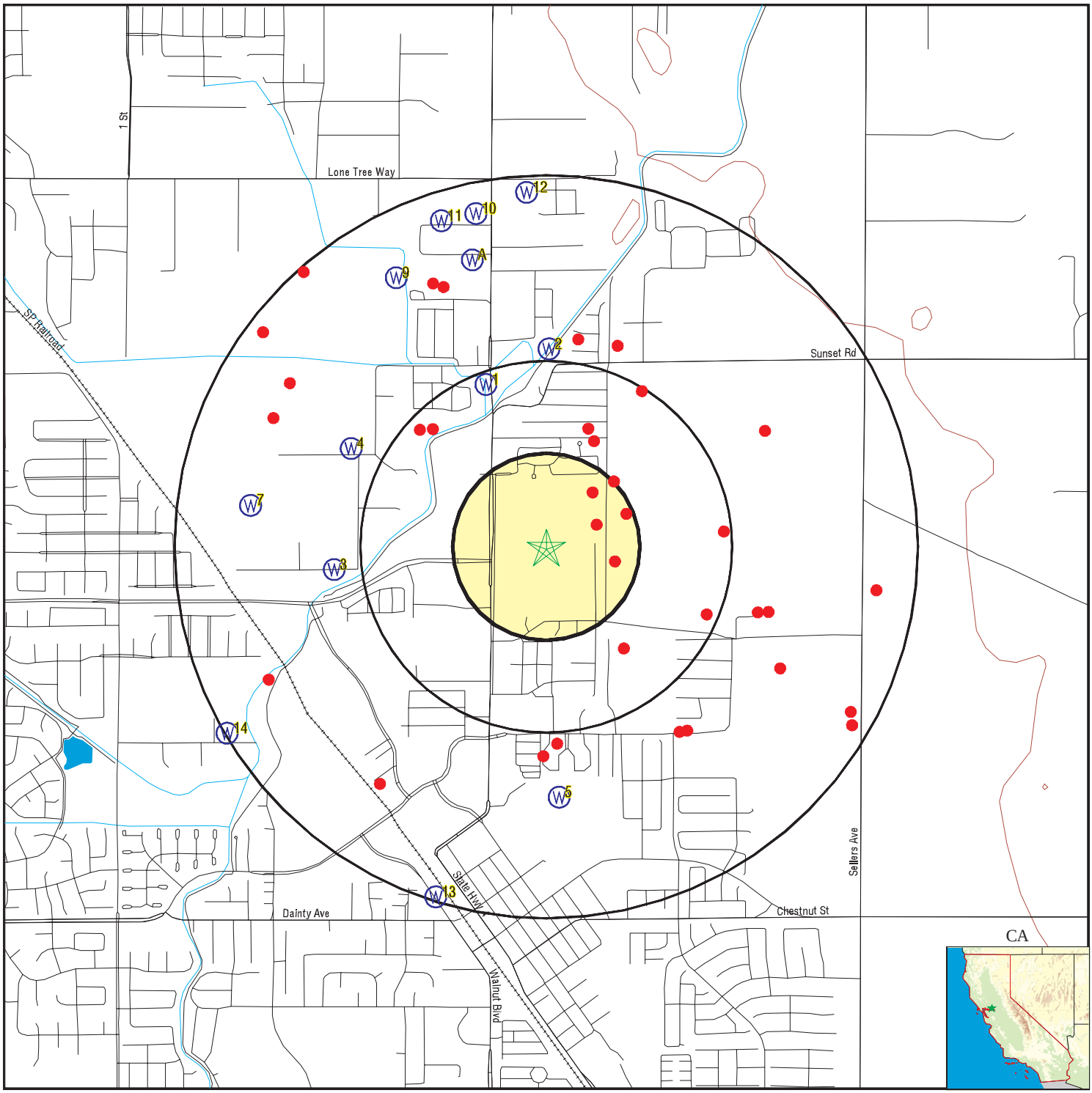
MAP ID	WELL ID	LOCATION FROM TP
1	81	1/4 - 1/2 Mile NNW
2	78	1/2 - 1 Mile North
5	84	1/2 - 1 Mile South
7	79	1/2 - 1 Mile West
10	63	1/2 - 1 Mile NNW
11	64	1/2 - 1 Mile NNW
12	62	1/2 - 1 Mile North

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

DISTANCE FROM TP (Miles)	DISTANCE FROM TP (Miles)
1/2 - 1 Mile NW	1/2 - 1 Mile NNW
1/2 - 1 Mile NNW	1/2 - 1 Mile NW
1/2 - 1 Mile North	1/2 - 1 Mile NNE
1/2 - 1 Mile WNW	1/4 - 1/2 Mile NNE
1/2 - 1 Mile WNW	1/4 - 1/2 Mile NNE
1/4 - 1/2 Mile NW	1/4 - 1/2 Mile NW
1/2 - 1 Mile ENE	1/4 - 1/2 Mile NNE
1/4 - 1/2 Mile NE	1/8 - 1/4 Mile NE
1/8 - 1/4 Mile ENE	1/8 - 1/4 Mile ENE
1/4 - 1/2 Mile East	1/8 - 1/4 Mile ESE
1/2 - 1 Mile East	1/2 - 1 Mile ESE
1/2 - 1 Mile ESE	1/4 - 1/2 Mile ESE
1/4 - 1/2 Mile SE	1/2 - 1 Mile ESE
1/2 - 1 Mile WSW	1/2 - 1 Mile ESE
1/2 - 1 Mile ESE	1/2 - 1 Mile SE
1/2 - 1 Mile SE	1/2 - 1 Mile South
1/2 - 1 Mile South	1/2 - 1 Mile SW

PHYSICAL SETTING SOURCE MAP - 2003264.2s



County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Closest Hydrogeological Data
Oil, gas or related wells

SITE NAME: 274250	CLIENT: AEI Consultants
ADDRESS: APN #016-170-010 Brentwood CA 94513	CONTACT: Keri Robinson INQUIRY #: 2003264.2s
LAT/LONG: 37.9472 / 121.6934	DATE: August 13, 2007 1:56 pm

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Map ID Direction Distance Elevation	Database	EDR ID Number
1 **NNW** **1/4 - 1/2 Mile** **Higher**	**CA WELLS**	**81**

Water System Information:

Prime Station Code:	01N/03E-07D01 M	User ID:	07C
FRDS Number:	0707578001	County:	Contra Costa
District Number:	37	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	375713.0 1214143.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 01		
System Number:	0707578		
System Name:	DAVIS CAMP		
Organization That Operates System:			
	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		
Sample Collected:	10/23/2001 00:00:00	Findings:	1.5 UG/L
Chemical:	BROMOFORM (THM)		
Sample Collected:	10/23/2001 00:00:00	Findings:	2.1 UG/L
Chemical:	TOTAL TRIHALOMETHANES		
Sample Collected:	10/23/2001 00:00:00	Findings:	1 UNITS
Chemical:	COLOR		
Sample Collected:	10/23/2001 00:00:00	Findings:	1700 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	10/23/2001 00:00:00	Findings:	7.5
Chemical:	PH, LABORATORY		
Sample Collected:	10/23/2001 00:00:00	Findings:	330 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	10/23/2001 00:00:00	Findings:	700 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	10/23/2001 00:00:00	Findings:	170 MG/L
Chemical:	CALCIUM		
Sample Collected:	10/23/2001 00:00:00	Findings:	67 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	10/23/2001 00:00:00	Findings:	140 MG/L
Chemical:	SODIUM		
Sample Collected:	10/23/2001 00:00:00	Findings:	2.5 MG/L
Chemical:	POTASSIUM		
Sample Collected:	10/23/2001 00:00:00	Findings:	220 MG/L
Chemical:	CHLORIDE		
Sample Collected:	10/23/2001 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	10/23/2001 00:00:00	Findings:	5 UG/L
Chemical:	ARSENIC		

Sample Collected:	10/23/2001 00:00:00	Findings:	.1 MG/L
Chemical:	FOAMING AGENTS (MBAS)		
Sample Collected:	10/23/2001 00:00:00	Findings:	1100 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	10/23/2001 00:00:00	Findings:	48 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/23/2001 00:00:00	Findings:	.1 NTU
Chemical:	TURBIDITY, LABORATORY		
Sample Collected:	07/18/2002 00:00:00	Findings:	37 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/14/2002 00:00:00	Findings:	33 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/17/2003 00:00:00	Findings:	44 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/21/2003 00:00:00	Findings:	36 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/22/2004 00:00:00	Findings:	41 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/29/2004 00:00:00	Findings:	34 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/18/2004 00:00:00	Findings:	1 UNITS
Chemical:	COLOR		
Sample Collected:	08/18/2004 00:00:00	Findings:	1600 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	08/18/2004 00:00:00	Findings:	7.3
Chemical:	PH, LABORATORY		
Sample Collected:	08/18/2004 00:00:00	Findings:	320 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	08/18/2004 00:00:00	Findings:	400 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	08/18/2004 00:00:00	Findings:	570 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	08/18/2004 00:00:00	Findings:	140 MG/L
Chemical:	CALCIUM		
Sample Collected:	08/18/2004 00:00:00	Findings:	53 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	08/18/2004 00:00:00	Findings:	140 MG/L
Chemical:	SODIUM		
Sample Collected:	08/18/2004 00:00:00	Findings:	1.4 MG/L
Chemical:	POTASSIUM		
Sample Collected:	08/18/2004 00:00:00	Findings:	220 MG/L
Chemical:	CHLORIDE		
Sample Collected:	08/18/2004 00:00:00	Findings:	.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		

Sample Collected:	08/18/2004 00:00:00	Findings:	19 UG/L
Chemical:	NICKEL		
Sample Collected:	08/18/2004 00:00:00	Findings:	1000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	08/18/2004 00:00:00	Findings:	32 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/18/2004 00:00:00	Findings:	.24 NTU
Chemical:	TURBIDITY, LABORATORY		
Sample Collected:	08/18/2004 00:00:00	Findings:	.66 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	04/20/2005 00:00:00	Findings:	7.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	07/25/2005 00:00:00	Findings:	27 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/19/2005 00:00:00	Findings:	29 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/18/2001 00:00:00	Findings:	50 MG/L
Chemical:	NITRATE (AS NO3)		

2
North **CA WELLS** **78**
1/2 - 1 Mile
Lower

Water System Information:

Prime Station Code:	01N/03E-06N01 M	User ID:	ENG
FRDS Number:	0710004006	County:	Contra Costa
District Number:	04	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	375718.0 1214132.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 06		
System Number:	0710004		
System Name:	CITY OF BRENTWOOD		
Organization That Operates System:			
	708 THIRD STREET		
	BRENTWOOD 94513		
Pop Served:	8255	Connections:	2167
Area Served:	BRENTWOOD		
Sample Collected:	09/11/2002 00:00:00	Findings:	11.8
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	09/11/2002 00:00:00	Findings:	3200 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	04/17/2003 00:00:00	Findings:	5 UNITS
Chemical:	COLOR		
Sample Collected:	04/17/2003 00:00:00	Findings:	1560 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	04/17/2003 00:00:00	Findings:	7.1
Chemical:	PH, LABORATORY		

Sample Collected:	04/17/2003 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	04/17/2003 00:00:00	Findings:	260 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	04/17/2003 00:00:00	Findings:	413 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	04/17/2003 00:00:00	Findings:	93 MG/L
Chemical:	CALCIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	44 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	171 MG/L
Chemical:	SODIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	4 MG/L
Chemical:	POTASSIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	205 MG/L
Chemical:	CHLORIDE		
Sample Collected:	04/17/2003 00:00:00	Findings:	.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	04/17/2003 00:00:00	Findings:	1180 UG/L
Chemical:	BORON		
Sample Collected:	04/17/2003 00:00:00	Findings:	9 UG/L
Chemical:	SELENIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	2.67 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	04/17/2003 00:00:00	Findings:	6.03 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	04/17/2003 00:00:00	Findings:	.215 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	04/17/2003 00:00:00	Findings:	.788 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	1210 UG/L
Chemical:	BORON		
Sample Collected:	09/11/2002 00:00:00	Findings:	8 UG/L
Chemical:	SELENIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	5.77 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	09/11/2002 00:00:00	Findings:	2.48 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	3.99 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	09/11/2002 00:00:00	Findings:	6.45 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	.22 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		

Sample Collected:	09/11/2002 00:00:00	Findings:	.381 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	1000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	09/11/2002 00:00:00	Findings:	- .1
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	09/11/2002 00:00:00	Findings:	14.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/29/2006 00:00:00	Findings:	11.9
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	03/29/2006 00:00:00	Findings:	4100 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	06/07/2006 00:00:00	Findings:	5.01 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	06/07/2006 00:00:00	Findings:	3.1 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	06/07/2006 00:00:00	Findings:	2.82 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	06/07/2006 00:00:00	Findings:	2.72 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	06/07/2006 00:00:00	Findings:	.174 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	06/07/2006 00:00:00	Findings:	.546 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	06/07/2006 00:00:00	Findings:	4.06 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	06/07/2006 00:00:00	Findings:	.977 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	06/02/2004 00:00:00	Findings:	1000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	06/02/2004 00:00:00	Findings:	- .7
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	06/02/2004 00:00:00	Findings:	17.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/02/2004 00:00:00	Findings:	.3 NTU
Chemical:	TURBIDITY, LABORATORY		
Sample Collected:	06/02/2004 00:00:00	Findings:	11.2
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	06/02/2004 00:00:00	Findings:	3900 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	06/30/2004 00:00:00	Findings:	7.61 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	06/30/2004 00:00:00	Findings:	3.23 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		

Sample Collected:	06/30/2004 00:00:00	Findings:	17.7 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	06/30/2004 00:00:00	Findings:	3.38 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	06/30/2004 00:00:00	Findings:	.214 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	06/30/2004 00:00:00	Findings:	.494 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	09/29/2004 00:00:00	Findings:	13.7 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	09/29/2004 00:00:00	Findings:	4.13 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	09/29/2004 00:00:00	Findings:	4.03 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	09/29/2004 00:00:00	Findings:	2.61 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	09/29/2004 00:00:00	Findings:	.201 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	09/29/2004 00:00:00	Findings:	.601 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	09/29/2004 00:00:00	Findings:	3.22 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	09/29/2004 00:00:00	Findings:	1.01 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	10/13/2004 00:00:00	Findings:	5.03 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	10/13/2004 00:00:00	Findings:	2.98 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	10/13/2004 00:00:00	Findings:	3.21 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	10/13/2004 00:00:00	Findings:	2.25 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	10/13/2004 00:00:00	Findings:	.117 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	10/13/2004 00:00:00	Findings:	.528 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	03/30/2005 00:00:00	Findings:	1500 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	03/30/2005 00:00:00	Findings:	7.5
Chemical:	PH, LABORATORY		
Sample Collected:	03/30/2005 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	03/30/2005 00:00:00	Findings:	270 MG/L
Chemical:	BICARBONATE ALKALINITY		

Sample Collected:	06/30/1999 00:00:00	Findings:	3 UNITS
Chemical:	COLOR		
Sample Collected:	06/30/1999 00:00:00	Findings:	1450 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	06/30/1999 00:00:00	Findings:	7.4
Chemical:	PH, LABORATORY		
Sample Collected:	06/30/1999 00:00:00	Findings:	230 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	06/30/1999 00:00:00	Findings:	280 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	06/30/1999 00:00:00	Findings:	420 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	06/30/1999 00:00:00	Findings:	94 MG/L
Chemical:	CALCIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	45 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	156 MG/L
Chemical:	SODIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	3
Chemical:	SODIUM ABSORPTION RATIO		
Sample Collected:	06/30/1999 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	184 MG/L
Chemical:	CHLORIDE		
Sample Collected:	06/30/1999 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	06/30/1999 00:00:00	Findings:	9 UG/L
Chemical:	SELENIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	2 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	06/30/1999 00:00:00	Findings:	8 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	06/30/1999 00:00:00	Findings:	8 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	03/30/2005 00:00:00	Findings:	422 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	03/30/2005 00:00:00	Findings:	95 MG/L
Chemical:	CALCIUM		
Sample Collected:	03/30/2005 00:00:00	Findings:	45 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	03/30/2005 00:00:00	Findings:	164 MG/L
Chemical:	SODIUM		
Sample Collected:	03/30/2005 00:00:00	Findings:	4 MG/L
Chemical:	POTASSIUM		

Sample Collected:	03/30/2005 00:00:00	Findings:	168 MG/L
Chemical:	CHLORIDE		
Sample Collected:	03/30/2005 00:00:00	Findings:	.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	03/30/2005 00:00:00	Findings:	1300 UG/L
Chemical:	BORON		
Sample Collected:	03/30/2005 00:00:00	Findings:	9 UG/L
Chemical:	SELENIUM		
Sample Collected:	12/26/2000 00:00:00	Findings:	6 UG/L
Chemical:	SELENIUM		
Sample Collected:	12/26/2000 00:00:00	Findings:	920 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	12/26/2000 00:00:00	Findings:	- .6
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	12/26/2000 00:00:00	Findings:	15.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/26/2000 00:00:00	Findings:	11.3
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	12/26/2000 00:00:00	Findings:	3400 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	01/10/2001 00:00:00	Findings:	6.09 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	01/10/2001 00:00:00	Findings:	3.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	01/10/2001 00:00:00	Findings:	7.95 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	01/10/2001 00:00:00	Findings:	7.5 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	01/10/2001 00:00:00	Findings:	.5 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	04/04/2001 00:00:00	Findings:	7.35 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	04/04/2001 00:00:00	Findings:	3.11 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	04/04/2001 00:00:00	Findings:	14.4 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	04/04/2001 00:00:00	Findings:	5.37 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	04/04/2001 00:00:00	Findings:	.555 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	05/02/2001 00:00:00	Findings:	16.1 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/01/2001 00:00:00	Findings:	1510 US
Chemical:	SPECIFIC CONDUCTANCE		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample Collected:	08/01/2001 00:00:00	Findings:	7.5
Chemical:	PH, LABORATORY		
Sample Collected:	08/01/2001 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	08/01/2001 00:00:00	Findings:	260 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	08/01/2001 00:00:00	Findings:	382 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	08/01/2001 00:00:00	Findings:	84 MG/L
Chemical:	CALCIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	42 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	163 MG/L
Chemical:	SODIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	4 MG/L
Chemical:	POTASSIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	174 MG/L
Chemical:	CHLORIDE		
Sample Collected:	08/01/2001 00:00:00	Findings:	.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/01/2001 00:00:00	Findings:	8 UG/L
Chemical:	SELENIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	3.94 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	08/01/2001 00:00:00	Findings:	1.96 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	08/01/2001 00:00:00	Findings:	3.32 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	08/01/2001 00:00:00	Findings:	1.32 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	08/01/2001 00:00:00	Findings:	.293 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	03/30/2005 00:00:00	Findings:	980 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	03/30/2005 00:00:00	Findings:	.3
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	03/30/2005 00:00:00	Findings:	15.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/30/2005 00:00:00	Findings:	12.2
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	03/30/2005 00:00:00	Findings:	3500 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	09/07/2005 00:00:00	Findings:	6.16 PCI/L
Chemical:	GROSS ALPHA		

Sample Collected:	09/07/2005 00:00:00	Findings:	3.23 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	09/07/2005 00:00:00	Findings:	2.44 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	09/07/2005 00:00:00	Findings:	.138 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	09/07/2005 00:00:00	Findings:	.496 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	09/07/2005 00:00:00	Findings:	5.11 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	09/07/2005 00:00:00	Findings:	1.07 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	12/07/2005 00:00:00	Findings:	4.64 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	12/07/2005 00:00:00	Findings:	3.16 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	12/07/2005 00:00:00	Findings:	3.84 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	12/07/2005 00:00:00	Findings:	2.62 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	12/07/2005 00:00:00	Findings:	.252 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	12/07/2005 00:00:00	Findings:	.507 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	12/07/2005 00:00:00	Findings:	3.34 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	12/07/2005 00:00:00	Findings:	.981 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	5 UNITS
Chemical:	COLOR		
Sample Collected:	03/29/2006 00:00:00	Findings:	1590 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	03/29/2006 00:00:00	Findings:	7.2
Chemical:	PH, LABORATORY		
Sample Collected:	03/29/2006 00:00:00	Findings:	210 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	03/29/2006 00:00:00	Findings:	260 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	03/29/2006 00:00:00	Findings:	416 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	03/29/2006 00:00:00	Findings:	94 MG/L
Chemical:	CALCIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	44 MG/L
Chemical:	MAGNESIUM		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample Collected:	03/29/2006 00:00:00	Findings:	160 MG/L
Chemical:	SODIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	206 MG/L
Chemical:	CHLORIDE		
Sample Collected:	03/29/2006 00:00:00	Findings:	.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	03/29/2006 00:00:00	Findings:	1200 UG/L
Chemical:	BORON		
Sample Collected:	03/29/2006 00:00:00	Findings:	8 UG/L
Chemical:	SELENIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	970 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	04/17/2003 00:00:00	Findings:	- .1
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	04/17/2003 00:00:00	Findings:	17.8 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/17/2003 00:00:00	Findings:	11.8
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	04/17/2003 00:00:00	Findings:	4000 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	09/10/2003 00:00:00	Findings:	2.09 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	08/01/2001 00:00:00	Findings:	990 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	08/01/2001 00:00:00	Findings:	.3
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	08/01/2001 00:00:00	Findings:	14.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/01/2001 00:00:00	Findings:	12.2
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	10/10/2001 00:00:00	Findings:	6.14 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	10/10/2001 00:00:00	Findings:	2.54 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	10/10/2001 00:00:00	Findings:	7.11 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	10/10/2001 00:00:00	Findings:	6.09 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	10/10/2001 00:00:00	Findings:	.251 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	02/27/2002 00:00:00	Findings:	17.7 MG/L
Chemical:	NITRATE (AS NO3)		

Sample Collected:	09/11/2002 00:00:00	Findings:	5 UNITS
Chemical:	COLOR		
Sample Collected:	09/11/2002 00:00:00	Findings:	1530 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	09/11/2002 00:00:00	Findings:	7.1
Chemical:	PH, LABORATORY		
Sample Collected:	09/11/2002 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	09/11/2002 00:00:00	Findings:	270 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	09/11/2002 00:00:00	Findings:	420 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	09/11/2002 00:00:00	Findings:	94 MG/L
Chemical:	CALCIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	45 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	148 MG/L
Chemical:	SODIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	4 MG/L
Chemical:	POTASSIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	181 MG/L
Chemical:	CHLORIDE		
Sample Collected:	09/11/2002 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09/10/2003 00:00:00	Findings:	2.15 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	09/10/2003 00:00:00	Findings:	2.02 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	09/10/2003 00:00:00	Findings:	.133 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	09/10/2003 00:00:00	Findings:	.222 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	11/18/2003 00:00:00	Findings:	7.17 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	11/18/2003 00:00:00	Findings:	2.58 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	11/18/2003 00:00:00	Findings:	6.24 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	11/18/2003 00:00:00	Findings:	2.08 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	2.72 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	2.86 PCI/L
Chemical:	GROSS BETA		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample Collected:	03/29/2006 00:00:00	Findings:	2.49 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	.179 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	.508 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	11/18/2003 00:00:00	Findings:	.281 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	11/18/2003 00:00:00	Findings:	.4 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	11/18/2003 00:00:00	Findings:	4.41 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	11/18/2003 00:00:00	Findings:	.997 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	06/02/2004 00:00:00	Findings:	1600 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	06/02/2004 00:00:00	Findings:	6.5
Chemical:	PH, LABORATORY		
Sample Collected:	06/02/2004 00:00:00	Findings:	210 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	06/02/2004 00:00:00	Findings:	260 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	06/02/2004 00:00:00	Findings:	418 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	06/02/2004 00:00:00	Findings:	95 MG/L
Chemical:	CALCIUM		
Sample Collected:	06/02/2004 00:00:00	Findings:	44 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	06/02/2004 00:00:00	Findings:	173 MG/L
Chemical:	SODIUM		
Sample Collected:	06/02/2004 00:00:00	Findings:	4 MG/L
Chemical:	POTASSIUM		
Sample Collected:	06/02/2004 00:00:00	Findings:	215 MG/L
Chemical:	CHLORIDE		
Sample Collected:	06/02/2004 00:00:00	Findings:	.7 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	06/02/2004 00:00:00	Findings:	1100 UG/L
Chemical:	BORON		
Sample Collected:	06/02/2004 00:00:00	Findings:	8 UG/L
Chemical:	SELENIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	1010 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	03/29/2006 00:00:00	Findings:	18.3 MG/L
Chemical:	NITRATE (AS NO3)		

Sample Collected:	06/30/1999 00:00:00	Findings:	930 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	06/30/1999 00:00:00	Findings:	.2
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	06/30/1999 00:00:00	Findings:	14.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/30/1999 00:00:00	Findings:	.5 NTU
Chemical:	TURBIDITY, LABORATORY		
Sample Collected:	06/30/1999 00:00:00	Findings:	12.1
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	06/30/1999 00:00:00	Findings:	3300 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	10/30/2000 00:00:00	Findings:	4.89 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	10/30/2000 00:00:00	Findings:	2.4 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	12/26/2000 00:00:00	Findings:	1510 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	12/26/2000 00:00:00	Findings:	6.6
Chemical:	PH, LABORATORY		
Sample Collected:	12/26/2000 00:00:00	Findings:	210 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	12/26/2000 00:00:00	Findings:	260 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	12/26/2000 00:00:00	Findings:	410 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	12/26/2000 00:00:00	Findings:	90 MG/L
Chemical:	CALCIUM		
Sample Collected:	12/26/2000 00:00:00	Findings:	45 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	12/26/2000 00:00:00	Findings:	157 MG/L
Chemical:	SODIUM		
Sample Collected:	12/26/2000 00:00:00	Findings:	4 MG/L
Chemical:	POTASSIUM		
Sample Collected:	12/26/2000 00:00:00	Findings:	180 MG/L
Chemical:	CHLORIDE		
Sample Collected:	12/26/2000 00:00:00	Findings:	.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		

3
West
1/2 - 1 Mile
Higher

FED USGS **USGS3222019**

Agency cd:	USGS	Site no:	375647121421001
Site name:	001N002E12K001M		
Latitude:	375647		
Longitude:	1214210	Dec lat:	37.9463121
Dec lon:	-121.70384205	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	013
Country:	US	Land net:	NWNWSES12T01NR02EM
Location map:	BRENTWOOD	Map scale:	24000
Altitude:	65.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	2.5		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Joaquin Delta. California. Area = 938 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19660212
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	105	Hole depth:	105
Source of depth data:	Not Reported		
Project number:	8479423710		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

4
WNW
1/2 - 1 Mile
Higher

FED USGS **USGS3221810**

Agency cd:	USGS	Site no:	375704121420701
Site name:	001N002E12G001M		
Latitude:	375704		
Longitude:	1214207	Dec lat:	37.95103421
Dec lon:	-121.70300874	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	013
Country:	US	Land net:	NESWNES12T01NR02EM
Location map:	BRENTWOOD	Map scale:	24000
Altitude:	66.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	2.5		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Joaquin Delta. California. Area = 938 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19730716
Date inventoried:	Not Reported	Mean greenwich time offset:	PST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	110	Hole depth:	160
Source of depth data:	Not Reported		
Project number:	8479423710		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1973-07-16	Ground water data end date:	1973-07-16
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1973-07-16	28.00	

5
South
1/2 - 1 Mile
Higher

CA WELLS **84**

Water System Information:

Prime Station Code:	01N/03E-18D01 M	User ID:	07C
FRDS Number:	0707508001	County:	Contra Costa
District Number:	37	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	375615.0 1214130.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 01		
System Number:	0707508		
System Name:	LIBERTY UNION HIGH SCHOOL		
Organization That Operates System:	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		

A6
NNW
1/2 - 1 Mile
Higher

FED USGS **USGS3221839**

Agency cd:	USGS	Site no:	375730121414601
Site name:	001N002E01R001M		
Latitude:	375730		
Longitude:	1214146	Dec lat:	37.95825626
Dec lon:	-121.69717539	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	013
Country:	US	Land net:	NESESES01T01NR02EM
Location map:	BRENTWOOD	Map scale:	24000

Altitude:	73.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	2.5		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Joaquin Delta. California. Area = 938 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19780528
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	152	Hole depth:	180
Source of depth data:	Not Reported		
Project number:	8479423710		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

7
West **CA WELLS** **79**
1/2 - 1 Mile
Higher

Water System Information:

Prime Station Code:	01N/03E-06N02 M	User ID:	ENG
FRDS Number:	0710004007	County:	Contra Costa
District Number:	04	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	375656.0 1214225.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 07		
System Number:	0710004		
System Name:	CITY OF BRENTWOOD		
Organization That Operates System:			
	708 THIRD STREET BRENTWOOD 94513		
Pop Served:	8255	Connections:	2167
Area Served:	BRENTWOOD		
Sample Collected:	09/11/2002 00:00:00	Findings:	270 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	09/11/2002 00:00:00	Findings:	301 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	09/11/2002 00:00:00	Findings:	68 MG/L
Chemical:	CALCIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	32 MG/L
Chemical:	MAGNESIUM		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample Collected:	09/11/2002 00:00:00	Findings:	120 MG/L
Chemical:	SODIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	105 MG/L
Chemical:	CHLORIDE		
Sample Collected:	09/11/2002 00:00:00	Findings:	.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09/11/2002 00:00:00	Findings:	1340 UG/L
Chemical:	BORON		
Sample Collected:	09/11/2002 00:00:00	Findings:	7 UG/L
Chemical:	SELENIUM		
Sample Collected:	09/11/2002 00:00:00	Findings:	4.11 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	09/11/2002 00:00:00	Findings:	1.85 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	3.29 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	.3 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	.471 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	09/11/2002 00:00:00	Findings:	760 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	09/11/2002 00:00:00	Findings:	- .1
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	09/11/2002 00:00:00	Findings:	6.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/11/2002 00:00:00	Findings:	.2 NTU
Chemical:	TURBIDITY, LABORATORY		
Sample Collected:	09/11/2002 00:00:00	Findings:	11.8
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	09/11/2002 00:00:00	Findings:	1400 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	04/17/2003 00:00:00	Findings:	5 UNITS
Chemical:	COLOR		
Sample Collected:	04/17/2003 00:00:00	Findings:	1190 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	04/17/2003 00:00:00	Findings:	7.4
Chemical:	PH, LABORATORY		
Sample Collected:	04/17/2003 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	04/17/2003 00:00:00	Findings:	270 MG/L
Chemical:	BICARBONATE ALKALINITY		

Sample Collected:	04/17/2003 00:00:00	Findings:	300 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	04/17/2003 00:00:00	Findings:	69 MG/L
Chemical:	CALCIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	31 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	137 MG/L
Chemical:	SODIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	110 MG/L
Chemical:	CHLORIDE		
Sample Collected:	04/17/2003 00:00:00	Findings:	.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	04/17/2003 00:00:00	Findings:	1380 UG/L
Chemical:	BORON		
Sample Collected:	04/17/2003 00:00:00	Findings:	8 UG/L
Chemical:	SELENIUM		
Sample Collected:	04/17/2003 00:00:00	Findings:	1.46 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	04/17/2003 00:00:00	Findings:	1.07 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	04/17/2003 00:00:00	Findings:	.262 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	04/17/2003 00:00:00	Findings:	.773 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	06/30/1999 00:00:00	Findings:	3 UNITS
Chemical:	COLOR		
Sample Collected:	06/30/1999 00:00:00	Findings:	1140 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	06/30/1999 00:00:00	Findings:	7.4
Chemical:	PH, LABORATORY		
Sample Collected:	06/30/1999 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	06/30/1999 00:00:00	Findings:	270 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	06/30/1999 00:00:00	Findings:	311 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	06/30/1999 00:00:00	Findings:	72 MG/L
Chemical:	CALCIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	32 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	124 MG/L
Chemical:	SODIUM		

Sample Collected:	06/30/1999 00:00:00	Findings:	3
Chemical:	SODIUM ABSORPTION RATIO		
Sample Collected:	06/30/1999 00:00:00	Findings:	2 MG/L
Chemical:	POTASSIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	99 MG/L
Chemical:	CHLORIDE		
Sample Collected:	06/30/1999 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	06/30/1999 00:00:00	Findings:	110 UG/L
Chemical:	IRON		
Sample Collected:	06/30/1999 00:00:00	Findings:	7 UG/L
Chemical:	SELENIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	2 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	06/30/1999 00:00:00	Findings:	6 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	06/30/1999 00:00:00	Findings:	4 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	3.15 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	03/29/2006 00:00:00	Findings:	1.83 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	2.95 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	03/29/2006 00:00:00	Findings:	1.42 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	.171 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	.456 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	04/17/2003 00:00:00	Findings:	12
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	03/29/2006 00:00:00	Findings:	3.61 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	03/29/2006 00:00:00	Findings:	830 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	03/29/2006 00:00:00	Findings:	7.7 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	04/17/2003 00:00:00	Findings:	1900 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	03/18/2004 00:00:00	Findings:	2.24 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	03/18/2004 00:00:00	Findings:	1.72 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		

Sample Collected:	03/18/2004 00:00:00	Findings:	.205 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	03/18/2004 00:00:00	Findings:	.617 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	03/29/2004 00:00:00	Findings:	1270 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	03/29/2004 00:00:00	Findings:	7.1
Chemical:	PH, LABORATORY		
Sample Collected:	03/29/2004 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	03/29/2004 00:00:00	Findings:	270 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	03/29/2004 00:00:00	Findings:	357 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	03/29/2004 00:00:00	Findings:	82 MG/L
Chemical:	CALCIUM		
Sample Collected:	03/29/2004 00:00:00	Findings:	37 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	03/29/2004 00:00:00	Findings:	138 MG/L
Chemical:	SODIUM		
Sample Collected:	03/29/2004 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	03/29/2004 00:00:00	Findings:	131 MG/L
Chemical:	CHLORIDE		
Sample Collected:	03/29/2004 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	03/29/2004 00:00:00	Findings:	1400 UG/L
Chemical:	BORON		
Sample Collected:	03/29/2004 00:00:00	Findings:	7 UG/L
Chemical:	SELENIUM		
Sample Collected:	06/30/1999 00:00:00	Findings:	720 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	06/30/1999 00:00:00	Findings:	.1
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	06/30/1999 00:00:00	Findings:	6.4 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	06/30/1999 00:00:00	Findings:	.3 NTU
Chemical:	TURBIDITY, LABORATORY		
Sample Collected:	06/30/1999 00:00:00	Findings:	12
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	06/30/1999 00:00:00	Findings:	1400 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	10/30/2000 00:00:00	Findings:	1.4 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		

Sample Collected:	12/20/2000 00:00:00	Findings:	1200 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	12/20/2000 00:00:00	Findings:	6.2
Chemical:	PH, LABORATORY		
Sample Collected:	12/20/2000 00:00:00	Findings:	210 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	12/20/2000 00:00:00	Findings:	260 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	12/20/2000 00:00:00	Findings:	300 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	12/20/2000 00:00:00	Findings:	66 MG/L
Chemical:	CALCIUM		
Sample Collected:	12/20/2000 00:00:00	Findings:	32 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	11.9
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	03/29/2006 00:00:00	Findings:	.876 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	1700 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	07/05/2006 00:00:00	Findings:	1.67 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	07/05/2006 00:00:00	Findings:	3.49 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	07/05/2006 00:00:00	Findings:	1.52 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	07/05/2006 00:00:00	Findings:	.148 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	07/05/2006 00:00:00	Findings:	.607 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	07/05/2006 00:00:00	Findings:	3.58 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	07/05/2006 00:00:00	Findings:	.839 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	03/29/2004 00:00:00	Findings:	760 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	03/29/2004 00:00:00	Findings:	- .1
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	03/29/2004 00:00:00	Findings:	10.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/29/2004 00:00:00	Findings:	11.8
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	03/29/2004 00:00:00	Findings:	2300 UG/L
Chemical:	NITRATE + NITRITE (AS N)		

Sample Collected:	06/30/2004 00:00:00	Findings:	9.37 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	06/30/2004 00:00:00	Findings:	3.47 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	06/30/2004 00:00:00	Findings:	21.4 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	06/30/2004 00:00:00	Findings:	3.64 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	06/30/2004 00:00:00	Findings:	.142 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	06/30/2004 00:00:00	Findings:	.482 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	06/30/2004 00:00:00	Findings:	3.71 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	06/30/2004 00:00:00	Findings:	1.09 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	03/30/2005 00:00:00	Findings:	1370 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	03/30/2005 00:00:00	Findings:	7.5
Chemical:	PH, LABORATORY		
Sample Collected:	03/30/2005 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	03/30/2005 00:00:00	Findings:	260 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	03/30/2005 00:00:00	Findings:	348 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	03/30/2005 00:00:00	Findings:	80 MG/L
Chemical:	CALCIUM		
Sample Collected:	03/30/2005 00:00:00	Findings:	36 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	03/30/2005 00:00:00	Findings:	161 MG/L
Chemical:	SODIUM		
Sample Collected:	03/30/2005 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	12/20/2000 00:00:00	Findings:	133 MG/L
Chemical:	SODIUM		
Sample Collected:	12/20/2000 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	12/20/2000 00:00:00	Findings:	102 MG/L
Chemical:	CHLORIDE		
Sample Collected:	12/20/2000 00:00:00	Findings:	.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	12/20/2000 00:00:00	Findings:	6 UG/L
Chemical:	SELENIUM		

Sample Collected:	12/20/2000 00:00:00	Findings:	740 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	12/20/2000 00:00:00	Findings:	- 1.1
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	12/20/2000 00:00:00	Findings:	6.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	12/20/2000 00:00:00	Findings:	10.7
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	12/20/2000 00:00:00	Findings:	1600 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	01/10/2001 00:00:00	Findings:	3.96 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	01/10/2001 00:00:00	Findings:	2.4 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	01/10/2001 00:00:00	Findings:	3.52 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	01/10/2001 00:00:00	Findings:	3.8 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	01/10/2001 00:00:00	Findings:	.6 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	04/04/2001 00:00:00	Findings:	3.07 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	04/04/2001 00:00:00	Findings:	1.38 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	04/04/2001 00:00:00	Findings:	9.6 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	04/04/2001 00:00:00	Findings:	2.78 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	04/04/2001 00:00:00	Findings:	.459 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	05/02/2001 00:00:00	Findings:	7.6 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/01/2001 00:00:00	Findings:	1210 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	08/01/2001 00:00:00	Findings:	7.6
Chemical:	PH, LABORATORY		
Sample Collected:	08/01/2001 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	08/01/2001 00:00:00	Findings:	270 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	08/01/2001 00:00:00	Findings:	290 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	08/01/2001 00:00:00	Findings:	65 MG/L
Chemical:	CALCIUM		

Sample Collected:	08/01/2001 00:00:00	Findings:	31 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	140 MG/L
Chemical:	SODIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	106 MG/L
Chemical:	CHLORIDE		
Sample Collected:	08/01/2001 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08/01/2001 00:00:00	Findings:	8 UG/L
Chemical:	SELENIUM		
Sample Collected:	08/01/2001 00:00:00	Findings:	1.57 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	08/01/2001 00:00:00	Findings:	6.52 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	08/01/2001 00:00:00	Findings:	1.82 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	08/01/2001 00:00:00	Findings:	.246 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	03/30/2005 00:00:00	Findings:	155 MG/L
Chemical:	CHLORIDE		
Sample Collected:	03/30/2005 00:00:00	Findings:	.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	03/30/2005 00:00:00	Findings:	1500 UG/L
Chemical:	BORON		
Sample Collected:	03/30/2005 00:00:00	Findings:	8 UG/L
Chemical:	SELENIUM		
Sample Collected:	03/30/2005 00:00:00	Findings:	880 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	03/30/2005 00:00:00	Findings:	.2
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	03/30/2005 00:00:00	Findings:	5.3 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/01/2001 00:00:00	Findings:	790 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	08/01/2001 00:00:00	Findings:	.3
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	08/01/2001 00:00:00	Findings:	6.9 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	08/01/2001 00:00:00	Findings:	12.2
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	08/08/2001 00:00:00	Findings:	9 UNITS
Chemical:	COLOR		

Sample Collected:	10/31/2001 00:00:00	Findings:	3.94 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	10/31/2001 00:00:00	Findings:	1.92 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	10/31/2001 00:00:00	Findings:	4.76 PCI/L
Chemical:	GROSS BETA		
Sample Collected:	10/31/2001 00:00:00	Findings:	2.54 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	10/31/2001 00:00:00	Findings:	.294 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	02/27/2002 00:00:00	Findings:	7.5 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	09/11/2002 00:00:00	Findings:	5 UNITS
Chemical:	COLOR		
Sample Collected:	09/11/2002 00:00:00	Findings:	1160 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	09/11/2002 00:00:00	Findings:	7.2
Chemical:	PH, LABORATORY		
Sample Collected:	09/11/2002 00:00:00	Findings:	220 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	04/17/2003 00:00:00	Findings:	760 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	04/17/2003 00:00:00	Findings:	.1
Chemical:	LANGELIER INDEX AT SOURCE TEMP.		
Sample Collected:	04/17/2003 00:00:00	Findings:	8.2 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	03/30/2005 00:00:00	Findings:	12.1
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)		
Sample Collected:	03/30/2005 00:00:00	Findings:	1200 UG/L
Chemical:	NITRATE + NITRITE (AS N)		
Sample Collected:	07/06/2005 00:00:00	Findings:	6.46 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	07/06/2005 00:00:00	Findings:	3.39 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	07/06/2005 00:00:00	Findings:	2.39 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	07/06/2005 00:00:00	Findings:	.228 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	07/06/2005 00:00:00	Findings:	.458 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	07/06/2005 00:00:00	Findings:	3.33 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	07/06/2005 00:00:00	Findings:	.817 PCI/L
Chemical:	URANIUM COUNTING ERROR		

Sample Collected:	10/05/2005 00:00:00	Findings:	7.08 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	10/05/2005 00:00:00	Findings:	2.73 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	10/05/2005 00:00:00	Findings:	1.36 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	10/05/2005 00:00:00	Findings:	.284 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	10/05/2005 00:00:00	Findings:	.496 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	10/05/2005 00:00:00	Findings:	3.15 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	10/05/2005 00:00:00	Findings:	.835 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	01/04/2006 00:00:00	Findings:	6.15 PCI/L
Chemical:	GROSS ALPHA		
Sample Collected:	01/04/2006 00:00:00	Findings:	2.6 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	01/04/2006 00:00:00	Findings:	1.13 PCI/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	01/04/2006 00:00:00	Findings:	.148 PCI/L
Chemical:	RADIUM 226 COUNTING ERROR		
Sample Collected:	01/04/2006 00:00:00	Findings:	.424 PCI/L
Chemical:	RADIUM 228 COUNTING ERROR		
Sample Collected:	01/04/2006 00:00:00	Findings:	3.5 PCI/L
Chemical:	URANIUM (PCI/L)		
Sample Collected:	01/04/2006 00:00:00	Findings:	1.17 PCI/L
Chemical:	URANIUM COUNTING ERROR		
Sample Collected:	03/29/2006 00:00:00	Findings:	1270 US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	03/29/2006 00:00:00	Findings:	7.3
Chemical:	PH, LABORATORY		
Sample Collected:	03/29/2006 00:00:00	Findings:	210 MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	03/29/2006 00:00:00	Findings:	240 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	03/29/2006 00:00:00	Findings:	302 MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	03/29/2006 00:00:00	Findings:	70 MG/L
Chemical:	CALCIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	31 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	141 MG/L
Chemical:	SODIUM		

Sample Collected:	03/29/2006 00:00:00	Findings:	3 MG/L
Chemical:	POTASSIUM		
Sample Collected:	03/29/2006 00:00:00	Findings:	137 MG/L
Chemical:	CHLORIDE		
Sample Collected:	03/29/2006 00:00:00	Findings:	.3 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	03/29/2006 00:00:00	Findings:	1400 UG/L
Chemical:	BORON		
Sample Collected:	03/29/2006 00:00:00	Findings:	6 UG/L
Chemical:	SELENIUM		

A8
NNW
1/2 - 1 Mile
Higher

FED USGS **USGS3221841**

Agency cd:	USGS	Site no:	375731121414501
Site name:	001N002E01J002M		
Latitude:	375731		
Longitude:	1214145	Dec lat:	37.95853403
Dec lon:	-121.69689761	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	013
Country:	US	Land net:	SENESES01T01NR02EM
Location map:	BRENTWOOD	Map scale:	24000
Altitude:	75.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	2.5		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Joaquin Delta. California. Area = 938 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19780528
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	134	Hole depth:	136
Source of depth data:	Not Reported		
Project number:	8479423710		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

9
NNW
1/2 - 1 Mile
Higher

FED USGS **USGS3221837**

Agency cd:	USGS	Site no:	375728121415901
Site name:	001N002E01R002M		
Latitude:	375728		
Longitude:	1214159	Dec lat:	37.95770071
Dec lon:	-121.70078654	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	013
Country:	US	Land net:	NWSESES01T01NR02EM
Location map:	BRENTWOOD	Map scale:	24000
Altitude:	63.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	2.5		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Joaquin Delta. California. Area = 938 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19780528
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	159	Hole depth:	164
Source of depth data:	Not Reported		
Project number:	8479423710		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

10
NNW **CA WELLS** **63**
1/2 - 1 Mile
Higher

Water System Information:

Prime Station Code:	01N/02E-01J04 M	User ID:	07C
FRDS Number:	0707520001	County:	Contra Costa
District Number:	37	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	375737.0 1214145.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 01		
System Number:	0707520		
System Name:	DOMINGUEZ SMALL WATER SYSTEM		
Organization That Operates System:	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		

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NNW **CA WELLS** **64**
1/2 - 1 Mile
Higher

Water System Information:

Prime Station Code:	01N/02E-01J05 M	User ID:	07C
FRDS Number:	0706001001	County:	Contra Costa
District Number:	37	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	375736.0 1214151.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 01		
System Number:	0706001		
System Name:	CHAKEDIS WATER SYSTEM		
Organization That Operates System:	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		

12
North **CA WELLS** **62**
1/2 - 1 Mile
Higher

Water System Information:

Prime Station Code:	01N/02E-01J03 M	User ID:	07C
FRDS Number:	0707524001	County:	Contra Costa
District Number:	37	Station Type:	WELL/AMBNT/MUN/INTAKE
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	375740.0 1214136.0	Precision:	1,000 Feet (10 Seconds)
Source Name:	WELL 01		
System Number:	0707524		
System Name:	SHORT STOP #151		
Organization That Operates System:	Not Reported		
Pop Served:	Unknown, Small System	Connections:	Unknown, Small System
Area Served:	Not Reported		

13
SSW **FED USGS** **USGS3221946**
1/2 - 1 Mile
Higher

Agency cd:	USGS	Site no:	375601121415201
Site name:	001N002E13H001M		
Latitude:	375601		
Longitude:	1214152	Dec lat:	37.93353467
Dec lon:	-121.69884188	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	013
Country:	US	Land net:	Not Reported
Location map:	BRENTWOOD	Map scale:	24000
Altitude:	73.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	2		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Joaquin Delta. California. Area = 938 sq.mi.		
Topographic:	Not Reported		
Site type:	Ground-water other than Spring	Date construction:	19660228
Date inventoried:	Not Reported	Mean greenwich time offset:	PST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ALLUVIAL FAN DEPOSITS		
Well depth:	145	Hole depth:	155
Source of depth data:	Not Reported		
Project number:	8479423710		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1974-07-19
Water quality data end date:	1976-06-15	Water quality data count:	2
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

14
WSW **FED USGS** **USGS3221986**
1/2 - 1 Mile
Higher

Agency cd:	USGS	Site no:	375624121422901
Site name:	001N002E12N001M		
Latitude:	375624		
Longitude:	1214229	Dec lat:	37.93992336
Dec lon:	-121.70911985	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	013
Country:	US	Land net:	SWSWSWS12T01NR02EM
Location map:	BRENTWOOD	Map scale:	24000
Altitude:	65.00		
Altitude method:	Interpolated from topographic map		
Altitude accuracy:	2.5		
Altitude datum:	National Geodetic Vertical Datum of 1929		
Hydrologic:	San Joaquin Delta. California. Area = 938 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19780401
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	76.0	Hole depth:	80.0
Source of depth data:	Not Reported		
Project number:	8479423710		
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1978-04-01	Ground water data end date:	1978-04-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1978-04-01	30.00	

Direction Distance	Database	EDR ID Number

NW
1/2 - 1 Mile **OIL_GAS** **CA10178528**

Apinumber:	01320239	Operator:	Venada National
Lease:	Prewett-Lamport	Well no:	1-1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	HUD		
Latitude:	37.958		
Longitude:	-121.70429		
Td:	7496	Sec:	1
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NNW
1/2 - 1 Mile **OIL_GAS** **CA10178521**

Apinumber:	01320092	Operator:	Conoco Inc.
Lease:	Marsh Creek Unit B	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	006
Source:	hud		
Latitude:	37.95755		
Longitude:	-121.69791		
Td:	8668	Sec:	1
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NNW
1/2 - 1 Mile **OIL_GAS** **CA10178520**

Apinumber:	01320205	Operator:	Venoco, Inc.
Lease:	NGC-Cesa	Well no:	1
Field:	Oakley, South, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	017
Source:	GPS		
Latitude:	37.957412519		
Longitude:	-121.697397282		
Td:	8256	Sec:	1
Twn:	1N	Rge:	2E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

NW
1/2 - 1 Mile — **OIL_GAS** — **CA10178504**

Apinumber:	01300251	Operator:	SWEPI
Lease:	Prewett	Well no:	3-1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	006
Source:	hud		
Latitude:	37.95565		
Longitude:	-121.70629		
Td:	7525	Sec:	1
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

North
1/2 - 1 Mile — **OIL_GAS** — **CA10178502**

Apinumber:	01320223	Operator:	Western Continental Oper. Co.
Lease:	NGC-Kysh	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	025
Source:	hud		
Latitude:	37.95537		
Longitude:	-121.69076		
Td:	8535	Sec:	6
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NNE
1/2 - 1 Mile — **OIL_GAS** — **CA10178499**

Apinumber:	01320208	Operator:	Western Continental Oper. Co.
Lease:	NGC-Nunn	Well no:	3
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	hud		
Latitude:	37.95512		
Longitude:	-121.68882		
Td:	7917	Sec:	6
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

WNW
1/2 - 1 Mile **OIL_GAS** **CA10178484**

Apinumber:	01320359	Operator:	Production Specialties Co.
Lease:	Disco Inferno	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	hud		
Latitude:	37.953661		
Longitude:	-121.704965		
Td:	7053	Sec:	12
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NNE
1/4 - 1/2 Mile **OIL_GAS** **CA10178482**

Apinumber:	01320224	Operator:	Arkoma Production Co. of Calif.
Lease:	Stolich	Well no:	7-4
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	025
Source:	GPS		
Latitude:	37.953351065		
Longitude:	-121.687622049		
Td:	8467	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	location	District:	6

WNW
1/2 - 1 Mile **OIL_GAS** **CA10178469**

Apinumber:	01320230	Operator:	Reichhold Energy Corp.
Lease:	S & S Farms	Well no:	12-1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	hud		
Latitude:	37.9523		
Longitude:	-121.70578		
Td:	7254	Sec:	12
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

NNE
1/4 - 1/2 Mile **OIL_GAS** **CA10178464**

Apinumber:	01320232	Operator:	Lee & Jane Laird
Lease:	Marsh Creek Unit	Well no:	4
Field:	Oakley, South, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	025
Source:	GPS		
Latitude:	37.951885365		
Longitude:	-121.690264651		
Td:	8255	Sec:	7
Twn:	1N	Rge:	3E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NW
1/4 - 1/2 Mile **OIL_GAS** **CA10178463**

Apinumber:	01320087	Operator:	Conoco Inc.
Lease:	Marsh Creek Unit	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	hud		
Latitude:	37.95187		
Longitude:	-121.69792		
Td:	8692	Sec:	12
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NW
1/4 - 1/2 Mile **OIL_GAS** **CA10178462**

Apinumber:	01320097	Operator:	Conoco Inc.
Lease:	Marsh Creek Unit	Well no:	2
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	hud		
Latitude:	37.95184		
Longitude:	-121.69856		
Td:	7933	Sec:	12
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

ENE
1/2 - 1 Mile **OIL_GAS** **CA10178461**

Apinumber:	01320116	Operator:	Conoco Inc.
Lease:	Nunn	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	006
Source:	hud		
Latitude:	37.9518		
Longitude:	-121.68156		
Td:	9751	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NNE
1/4 - 1/2 Mile **OIL_GAS** **CA10178456**

Apinumber:	01320220	Operator:	Conoco Inc.
Lease:	Marsh Creek Unit	Well no:	3
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	025
Source:	hud		
Latitude:	37.9514		
Longitude:	-121.68998		
Td:	8450	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

NE
1/4 - 1/2 Mile **OIL_GAS** **CA10178450**

Apinumber:	01320195	Operator:	Arkoma Production Co. of Calif.
Lease:	Stolich	Well no:	7-1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	GPS		
Latitude:	37.949825942		
Longitude:	-121.689002401		
Td:	7945	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	location	District:	6

Direction Distance	Database	EDR ID Number

NE
1/8 - 1/4 Mile **OIL_GAS** **CA10178446**

Apinumber:	01320198	Operator:	Venoco Inc.
Lease:	Marsh Creek Unit	Well no:	2
Field:	Oakley, South, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	GPS		
Latitude:	37.949397341		
Longitude:	-121.690054904		
Td:	8231	Sec:	7
Twn:	1N	Rge:	3E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	OPR	District:	6

ENE
1/8 - 1/4 Mile **OIL_GAS** **CA10178442**

Apinumber:	01320206	Operator:	Arkoma Production Co. of Calif.
Lease:	Stolich	Well no:	7-2
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	GPS		
Latitude:	37.94856127		
Longitude:	-121.688391133		
Td:	8440	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	location	District:	6

ENE
1/8 - 1/4 Mile **OIL_GAS** **CA10178438**

Apinumber:	01320338	Operator:	Venoco, Inc.
Lease:	Sciortino	Well no:	1-7
Field:	Oakley, South, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	017
Source:	GPS		
Latitude:	37.948138444		
Longitude:	-121.689853771		
Td:	8485	Sec:	7
Twn:	1N	Rge:	3E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

East
1/4 - 1/2 Mile **OIL_GAS** **CA10178435**

Apinumber:	01320176	Operator:	Conoco Inc.
Lease:	Stolich	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	006
Source:	GPS		
Latitude:	37.947871203		
Longitude:	-121.683586449		
Td:	9274	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	location	District:	6

ESE
1/8 - 1/4 Mile **OIL_GAS** **CA10178425**

Apinumber:	01320204	Operator:	Production Specialties Co.
Lease:	Stolich	Well no:	35X-7
Field:	Oakley, South, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	025
Source:	GPS		
Latitude:	37.946706312		
Longitude:	-121.688950367		
Td:	8000	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	location	District:	6

East
1/2 - 1 Mile **OIL_GAS** **CA10178404**

Apinumber:	01320063	Operator:	Western Continental Oper. Co.
Lease:	Chase-Edgington	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	006
Source:	hud		
Latitude:	37.94558		
Longitude:	-121.67607		
Td:	8900	Sec:	8
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

ESE
1/2 - 1 Mile **OIL_GAS** **CA10178397**

Apinumber:	01320168	Operator:	Sunset Exploration Inc.
Lease:	NGC-Nunn	Well no:	2
Field:	Brentwood, East, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	016
Source:	GPS		
Latitude:	37.944731718		
Longitude:	-121.681385703		
Td:	8500	Sec:	7
Twn:	1N	Rge:	3E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

ESE
1/2 - 1 Mile **OIL_GAS** **CA10178396**

Apinumber:	01320153	Operator:	Sunset Exploration Inc.
Lease:	NGC-Nunn	Well no:	1
Field:	Brentwood, East, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	016
Source:	GPS		
Latitude:	37.944715071		
Longitude:	-121.681914328		
Td:	8479	Sec:	7
Twn:	1N	Rge:	3E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

ESE
1/4 - 1/2 Mile **OIL_GAS** **CA10178395**

Apinumber:	01320207	Operator:	Arkoma Production Co. of Calif.
Lease:	Stolich	Well no:	7-3
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	GPS		
Latitude:	37.944637164		
Longitude:	-121.684431016		
Td:	8439	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	location	District:	6

Direction Distance	Database	EDR ID Number

SE
1/4 - 1/2 Mile — **OIL_GAS** — **CA10178380**

Apinumber:	01320219	Operator:	Sunset Exploration, Inc.
Lease:	Bonnickson	Well no:	37-7
Field:	Oakley, South, Gas	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	017
Source:	GPS		
Latitude:	37.943308153		
Longitude:	-121.688511704		
Td:	7737	Sec:	7
Twn:	1N	Rge:	3E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

ESE
1/2 - 1 Mile — **OIL_GAS** — **CA10178376**

Apinumber:	01320165	Operator:	Dekalb Energy Co.
Lease:	McLeod	Well no:	77-7
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	hud		
Latitude:	37.94253		
Longitude:	-121.68081		
Td:	8515	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

WSW
1/2 - 1 Mile — **OIL_GAS** — **CA10178374**

Apinumber:	01320167	Operator:	Clarion Resources Inc.
Lease:	Dianda	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	hud		
Latitude:	37.94209		
Longitude:	-121.70601		
Td:	8150	Sec:	12
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

ESE
1/2 - 1 Mile **OIL_GAS** **CA10178355**

Apinumber:	01320132	Operator:	Dekalb Energy Co.
Lease:	Nunn	Well no:	21-17
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	hud		
Latitude:	37.94083		
Longitude:	-121.67733		
Td:	8796	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

ESE
1/2 - 1 Mile **OIL_GAS** **CA10178349**

Apinumber:	01320114	Operator:	Dekalb Energy Co.
Lease:	McLeod	Well no:	444-7
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	025
Source:	hud		
Latitude:	37.94031		
Longitude:	-121.67727		
Td:	9122	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

SE
1/2 - 1 Mile **OIL_GAS** **CA10178346**

Apinumber:	01320141	Operator:	Dekalb Energy Co.
Lease:	Davis	Well no:	52-18
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	006
Source:	hud		
Latitude:	37.9401		
Longitude:	-121.68539		
Td:	9000	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

SE
1/2 - 1 Mile **OIL_GAS** **CA10178345**

Apinumber:	01320137	Operator:	Dekalb Energy Co.
Lease:	Bonnickson	Well no:	48-7
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	024
Source:	hud		
Latitude:	37.94005		
Longitude:	-121.68577		
Td:	9168	Sec:	7
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

South
1/2 - 1 Mile **OIL_GAS** **CA10178343**

Apinumber:	01320285	Operator:	Horizon Operating Co.
Lease:	Brentwood Townsite	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	hud		
Latitude:	37.93959		
Longitude:	-121.6918		
Td:	7367	Sec:	18
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

South
1/2 - 1 Mile **OIL_GAS** **CA10178340**

Apinumber:	01320246	Operator:	Dekalb Energy Co.
Lease:	Brentwood Townsite	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	025
Source:	hud		
Latitude:	37.9391		
Longitude:	-121.69248		
Td:	7955	Sec:	18
Twn:	01N	Rge:	03E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

Direction Distance	Database	EDR ID Number

SW
1/2 - 1 Mile **OIL_GAS** **CA10178322**

Apinumber:	01320253	Operator:	Western Continental Oper. Co.
Lease:	NGC-Ghiggeri	Well no:	1
Field:	Not Reported	Cagaso m3 area:	Not Reported
Map:	608	Status cod:	007
Source:	HUD		
Latitude:	37.93802		
Longitude:	-121.70053		
Td:	8317	Sec:	13
Twn:	01N	Rge:	02E
Bm:	MD	X coord:	0
Y coord:	0	Zone:	Not Reported
Spuddate:	Not Reported	Abanddate:	Not Reported
Comments:	Not Reported	District:	6

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for CONTRA COSTA County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for CONTRA COSTA COUNTY, CA

Number of sites tested: 55

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.760 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.300 pCi/L	100%	0%	0%
Basement	0.525 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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APPENDIX C

REFERENCES

REFERENCES

Aerial Photographs: Environmental Data Resources, Inc.

Brentwood Building Department

Brentwood Fire Department

Brentwood Planning Department

California EPA Map of Radon Zones.

Contra Costa County Building Department

Contra Costa County Environmental Health Services Agency

Department of Oil and Gas (DOG)

East Contra Costa County Fire Department

Geologic Map of Brentwood, California, USGS

Sanborn Fire Insurance Map information: Environmental Data Resources, Inc.

ASTM E 1527-05 User Questionnaire

In order to qualify for the protection offered under the EPA All Appropriate Inquiry (AAI) Standard, the User (entities seeking to use the ASTM E1527-05 Practice to complete an environmental site assessment of the property: i.e. Lenders and/or Borrowers) must provide the following information (if available) to the environmental professional. Failure to provide this information could result in a determination that AAI is not complete. This information should be the collective knowledge of the entities relying on the Phase I. **Please note that you are not being asked to evaluate the property, but rather to provide your knowledge of information on the property.**

Site Name/Address: Brentwood Blvd. and Sandcreek Road, Brentwood, California

Person Interviewed/Title: Steve Thomas, Manager Date: 8/20/2007

If known, when was the property initially developed? vacant land

If different, when were the current building(s) on the property constructed? _____

1. Environmental cleanup liens that are filed or recorded against the site (40 CFR 312.25).

Are you aware of any environmental cleanup liens against the *property* that are filed or recorded under federal, tribal, state or local law? (**Note:** If unknown, a review of title records or an environmental lien search is recommended)

Yes [ ] No [X] If you answer yes, please include an explanation in the space provided below:

2. Activity and land use limitations that are in place on the site or that have been filed or recorded in a registry (40 CFR 312.26).

Are you aware of any AULs, such as *engineering controls*, land use restrictions or *institutional controls* that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?

Engineering Controls are defined as physical modifications to a site or facility to reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or ground water on the property). *Institutional Controls* are defined as a legal or administrative restriction on the use of, or access to, a site or facility to 1) reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or ground water on the property, or 2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment.

Yes [ ] No [X] If you answer yes, please include an explanation in the space provided below:

3. Specialized knowledge or experience of the person seeking to qualify for the LLP (40 CFR 312.28).

As the *User* of this *ESA* do you have any specialized knowledge or experience related to the *property* or nearby properties? For example, are you involved in the same line of business as the current or former *occupants* of the *property* or an adjoining *property* so that you would have specialized knowledge of the chemicals and processes used by this type of business?

Yes [ ] No [X] If you answer yes, please include an explanation in the space provided below:

4. Relationship of the purchase price to the fair market value of the *property* if it were not contaminated (40 CFR 312.29).

a) Does the purchase price being paid for this *property* reasonably reflect the fair market value of the *property*?

Yes [X] No [ ] If you answer no, please include an explanation in the space provided below, including whether the lower purchase price is because contamination is known or believed to be present at the *property*?

5. Commonly known or *reasonably ascertainable* information about the *property* (40 CFR 312.30)

Are you aware of commonly known or *reasonably ascertainable* information about the *property* that would help the *environmental professional* to identify conditions indicative of releases or threatened releases? For example, as *User*:

a. Do you know the past uses of the *property*?

Yes [X] No [ ]

b. Do you know of specific chemicals that are present or once were present at the *property*?

Yes [ ] No [X]

c. Do you know of spills or other chemical releases that have taken place at the *property*?

Yes [ ] No [X]

d. Do you know of any environmental cleanups that have taken place at the *property*?

Yes [ ] No [X]

If you answered yes to any of the questions above, please include an explanation in the space provided below:

a) Agricultural

6. The degree of obviousness of the presence of likely presence of contamination at the *property*, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31)

As the *User* of this *ESA*, based on your knowledge and experience related to the *property*, are there any *obvious* indicators that point to the presence or likely presence of contamination at the *property*?

Yes [ ] No [X] If you answer yes, please include an explanation in the space provided below:

Please provide the following property contact information:

Property Owner: Steve Thomas Phone Number: (925) 945-6266 ext 11

Key Site Personnel: Mark Anderson Phone Number: (925) 963-8006

Past Owner: _____ Phone Number: _____

AEI CONSULTANTS
ENVIRONMENTAL & CIVIL ENGINEERING

2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597
Phone: (925) 283-6000 Fax: (925) 944-2895

January 27, 2006

Contra Costa County Hazardous Materials Program
Attn: Ms. Dina Hutchins
4333 Pacheco Boulevard
Martinez, CA 94553

Subject: **Agricultural Chemical Survey Addendum**
Brentwood Blvd. & Sand Creek Road
APN: 016-170-002, -003, and -010
Brentwood, California
AEI Project No. 12767 (115132)

Dear Ms. Hutchins:

This report addendum describes the activities and results of the additional arsenic investigation in regards to the agricultural survey performed by AEI Consultants (AEI) at the above referenced property (Figure 1: Site Location Map). Details of the agricultural survey were originally reported by AEI in the Agricultural Chemical Survey dated January 9, 2006 (Appendix A). The additional activities were performed on behalf of Thomas Properties as requested by the Contra Costa County Hazardous Materials Program (CCCHMP) to investigate if the arsenic concentrations detected in shallow soils of the property pose a significant risk to human health and the environment. The property is currently under consideration for development with residential dwellings.

SITE DESCRIPTION

The subject property is located on the east side of Brentwood Boulevard near its intersection with Sand Creek Road in a mixed agricultural, residential, and commercial area of Brentwood (Figure 1). The property totals approximately 66.94 acres and consists primarily of vacant land formerly used for agricultural purposes. A fenced area is located at the northeast corner of the subject property. Located in the fenced area are compressors, meters, condensate tanks, and piping associated with natural gas production. An inactive natural gas production well is also located at the northeast corner of the subject property. An active natural gas production well is located at the east side of the subject property. Residences and farming structures were formerly located at the west side of the subject property. Concrete pads associated with these former buildings remain in place at the west side of the subject property.

The immediately surrounding properties consist of residences to the north; vacant land and natural gas production pump sites to the east; residences and vacant land to the south; and Sand Creek Plaza, Sand Creek Road and Brentwood Center beyond Brentwood Boulevard to the west.

FIELD ACTIVITIES

As requested by the CCCHMP, AEI performed additional soil sampling activities at the property on January 20, 2006. Soil sampling locations were chosen by randomly selecting eight of the original 64 sampling locations (approximately 13% of the original samples collected). The soil samples were collected from approximately 21 to 24 inches below ground surface (bgs), although the surface was uneven, having been recently plowed. In each location, a boring was hand augured to a depth of approximately 2 feet bgs and the soil sample was collected by driving brass liners into the base of the boring with a metal slide hammer. The full liners were sealed with Teflon tape and plastic end caps. The samples were stored in a cooler and chain of custody was initiated.

The samples were transported to McCampbell Analytical, Inc. of Pacheco, California (Department of Health Services Cert. # 1644). A total of 8 discrete soil samples were collected and each sample was analyzed for arsenic by EPA method 6020A. In addition, out of the 16 composite samples (64 discrete samples) originally collected on November 7 and 8, 2005 a total of 11 discrete samples were selected to be re-analyzed for arsenic by EPA method 6020A. The location for each of the soil samples is shown on Figure 2.

FINDINGS

Arsenic was detected in each of the discrete samples analyzed from 9 to 12 inches bgs at concentrations ranging from 11 milligrams per kilogram (mg/kg) to 20 mg/kg, with an average of 15.9 mg/kg. Arsenic was also detected in each of the discrete samples analyzed from 21 to 24 inches bgs at concentrations ranging from 8.0 mg/kg to 14 mg/kg, with an average of 10.2 mg/kg.

Analytical results are presented in Table 1 and a copy of the analytical report with chain of custody documents is included as Appendix B.

SUMMARY

In light of the planned development of the land for residential purposes, these findings were presented to the CCCHMP for review and concurrence that no further action is necessary with respect to historical pesticide use onsite for residential development to occur. The CCHMP has agreed that historical pesticide use at the site does not pose a threat to human health or the environment and no further action is required for this site. A copy of the CCCHMP no further action letter is included in Appendix C.

REPORT LIMITATION

This report presents a summary of work completed by AEI Consultants. The completed work includes observations and descriptions of site conditions encountered. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide the required information, but it cannot be assumed that they are representative of areas not sampled. All conclusions and/or recommendations are based on these analyses and observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document.

These services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work.

If you have any questions regarding our investigation, please do not hesitate to contact the undersigned at (925) 283-6000.

Sincerely,
AEI Consultants

Jeremy Smith
Project Manager

Peter J. McIntyre, P.G.
Senior Geologist

Attachments:

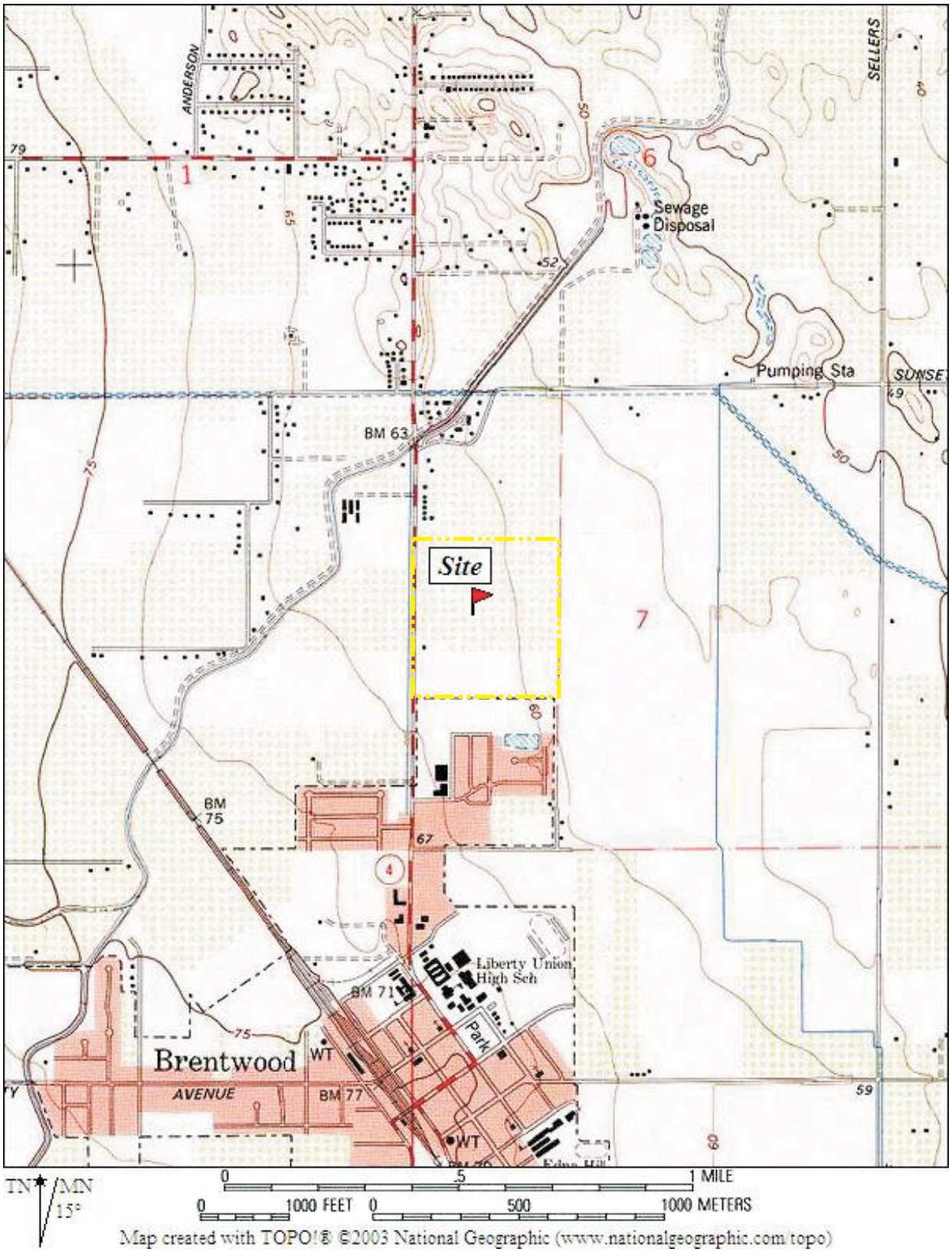
Figure 1 – Site Location Map
Figure 2 – Soil Sample Locations
Table 1 – Arsenic Soil Sample Analytical Data
Appendix A – Agricultural Chemical Survey dated January 9, 2006
Appendix B – Laboratory Analytical Report and Chain of Custody Documentation
Appendix C – CCCHMP Letter dated January 25, 2006

Distribution:

Mr. Steven Thomas
Thomas Properties
c/o Law Office of Mr. Timothy L. Clack
2500 Old Crow Canyon Road, Suite 123
San Ramon, CA 94583

CCCHMP
Ms. Dina Hutchins
4333 Pacheco Boulevard
Martinez, CA 94553

FIGURES



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

USGS TOPOGRAPHIC MAP
BRENTWOOD QUADRANGLE
Created 1975 Revised 1978

AEI CONSULTANTS
2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597

SITE LOCATION PLAN

Brentwood Blvd and Sand Creek Rd
Brentwood, CA

FIGURE 1
Job No: 12767

Scale:

0' 180' 360'

LEGEND

N

Soil Sampling Location

One Acre Square Grid

Composite Sample Boundary

Property Boundary

Sample Ids

AEI CONSULTANTS

2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597

Drawn by: JAS

Scale: 1" = 360'

SOIL SAMPLE LOCATIONS

Brentwood Blvd and Sand Creek Rd
Brentwood, CA

FIGURE 2
Job No: 12767

TABLES

TABLE 1
Brentwood Blvd. & Sand Creek Road
Brentwood, California
Arsenic Soil Sample Analytical Data

Composite Samples Depth 9 to 12 inches Samples Collected 11/7-8/05		Discrete Samples Depth 9 to 12 inches Samples Collected 11/7-8/05		Discrete Samples Depth 21 to 24 inches Samples Collected 1/20/05	
Sample ID	Arsenic - mg/kg	Sample ID	Arsenic - mg/kg	Sample ID	Arsenic - mg/kg
SS-1	17				
SS-2	16				
		SS-2 A	17	SS-2 A-2'	10
SS-3	15				
SS-4	15				
		SS-4 A	18	SS-4 A-2'	11
SS-5	15				
		SS-5 B	17	SS-5 B-2'	8.0
SS-6	17				
SS-7	16				
		SS-7 A	18		
		SS-7 B	20	SS-7 B-2'	11
		SS-7 C	12		
		SS-7 D	17		
SS-8	15				
SS-9	15				
SS-10	14				
		SS-10 C	18	SS-10 C-2'	14
SS-11	15				
SS-12	13				
		SS-12 C	14	SS-12 C-2'	11
SS-13	15				
		SS-13 D	13	SS-13 D-2'	8.3
SS-14	15				
SS-15	14				
		SS-15 D	11	SS-15 D-2'	8.5
SS-16	15				
		SS-17	19		
		SS-18	14		
		SS-19	14		
Average	15.1		15.9		10.2

mg/kg = milligrams per kilogram (parts per million)

APPENDIX A

AGRICULTURAL CHEMICAL SURVEY DATED JANUARY 9, 2006

APPENDIX B

LABORATORY ANALYTICAL REPORT WITH CHAIN OF CUSTODY DOCUMENTATION

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0511159 **ClientID: AEL** **EDF: NO**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #12767; Thomas Properties
PO: 1105-267

Bill to:
Diane
All Environmental, Inc.
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 5 days
Date Received: 11/08/2005
Date Add-On: 01/20/2006
Date Printed: 01/23/2006

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0511159-002	SS-2A	Soil	11/7/05	☐	B											
0511159-004	SS-4A	Soil	11/7/05	☐	B											
0511159-005	SS-5B	Soil	11/7/05	☐	B											
0511159-007	SS-7A	Soil	11/7/05	☐	B											
0511159-007	SS-7B	Soil	11/7/05	☐	C											
0511159-007	SS-7C	Soil	11/7/05	☐	D											
0511159-007	SS-7D	Soil	11/7/05	☐	E											
0511159-010	SS-10C	Soil	11/8/05	☐	B											
0511159-012	SS-12C	Soil	11/8/05	☐	B											
0511159-013	SS-13D	Soil	11/8/05	☐	B											
0511159-015	SS-15D	Soil	11/8/05	☐	B											

Test Legend:

1	ASMS_S	2		3		4		5	
6		7		8		9		10	
11		12							

Prepared by: Juanita Venegas

Comments: Discrete As added 1/20/06 added on 24hr Rush

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
		Date Received: 11/08/05
	Client Contact: Jeremy Smith	Date Extracted: 01/20/06
	Client P.O.: 1105-267	Date Analyzed: 01/20/06-01/23/06

Arsenic by ICP-MS*

Extraction method: SW3050B Analytical methods: 6020A Work Order: 0511159

Lab ID	Client ID	Matrix	Extraction	Arsenic	DF	% SS
0511159-002B	SS-2A	S	TTLC	17	1	102
0511159-004B	SS-4A	S	TTLC	18	1	108
0511159-005B	SS-5B	S	TTLC	17	1	102
0511159-007B	SS-7A	S	TTLC	18	1	98
0511159-007C	SS-7B	S	TTLC	20	1	101
0511159-007D	SS-7C	S	TTLC	12	1	95
0511159-007E	SS-7D	S	TTLC	17	1	104
0511159-010B	SS-10C	S	TTLC	18	1	101
0511159-012B	SS-12C	S	TTLC	14	1	89
0511159-013B	SS-13D	S	TTLC	13	1	106
0511159-015B	SS-15D	S	TTLC	11	1	101

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	TTLC	NA	mg/L
	S	TTLC	0.5	mg/Kg

*water samples are reported in µg/L, product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

means surrogate diluted out of range; ND means not detected above the reporting limit; N/A means not applicable to this sample or instrument.

i) aqueous sample containing greater than ~1 vol. % sediment; for DISSOLVED metals, this sample has been preserved prior to filtration; for TTLC metals, a representative sediment-water mixture was digested; j) reporting limit raised due to insufficient sample amount; k) reporting limit raised due to matrix interference; m) estimated value due to low/high surrogate recovery, caused by matrix interference; n) results are reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644 _____Angela Rydelius, Lab Manager

RUSH

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☒ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAY

EDF Required? ☐ Yes ☒ No

Report To: Jeremy Smith **Bill To:** same **P.O. #** 100202
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 **E-Mail:** jasmith@aeiconsultants.com
Tele: (925) 283-6000 **Fax:** (925) 283-6121
Project #: 12767 **Project Name:** Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road, Brentwood, CA
Sampler Signature: Adrian Mera

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	HVOCs EPA 8260	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	Arsenic EPA Method 6000 series	Organochlorine Pesticides Method 8080/8081	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other: HOLD	Other: Please composite sample prior to Analysis	Other	Other	Comments
SS-2A-2'		11/29/06	8:05	1	L		X				X												X											
SS-4A-2'			8:50	1	I		X				X												X											
SS-5B-2'			9:10	1	N		X				X												X											
SS-7B-2'			9:45	1	E		X				X												X											
SS-C10-2'			10:10	1	R		X				X												X											
SS-C12-2'			10:40				X				X												X											
SS-D13-2'			11:20				X				X												X											
SS-D15-2'			10:50				X				X												X											
SS-2A-4'			8:25				X				X																			X				
SS-C10-4'			10:25				X				X																			X				
SS-D15-4'			11:00				X				X																			X				
SS-5B-4'			9:25				X				X																			X				

Relinquished By:	Date:	Time:	Received By:
Adrian Mera	11/30/06	3:05	Kathleen Owen

ICE/t°_____ GOOD CONDITION_____ HEAD SPACE ABSENT_____ DECHLORINATED IN LAB_____

PRESERVATION APPROPRIATE CONTAINERS	VOAS	O&G	METALS	OTHER

PERSERVED IN LAB_____

PO#100202

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0601299 **ClientID: AEL** **EDF: NO**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #12767; Thomas Properties
PO: 100202

Bill to
Joanne Bryant
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 1 day

Date Received: **01/20/2006**
Date Printed: **01/20/2006**

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0601299-001	SS-2 A-2'	Soil	01/20/2006	☐	A											
0601299-002	SS-4 A-2'	Soil	01/20/2006	☐	A											
0601299-003	SS-5 B-2'	Soil	01/20/2006	☐	A											
0601299-004	SS-7 B-2'	Soil	01/20/2006	☐	A											
0601299-005	SS-C 10-2'	Soil	01/20/2006	☐	A											
0601299-006	SS-C 12-2'	Soil	01/20/2006	☐	A											
0601299-007	SS-D 13-2'	Soil	01/20/2006	☐	A											
0601299-008	SS-D 15-2'	Soil	01/20/2006	☐	A											

Test Legend:

1	ASMS_S	2		3		4		5	
6		7		8		9		10	
11		12							

Prepared by: Rosa Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #12767; Thomas Properties	Date Sampled: 01/20/06
		Date Received: 01/20/06
	Client Contact: Jeremy Smith	Date Extracted: 01/20/06
	Client P.O.: 100202	Date Analyzed: 01/21/06

Arsenic by ICP-MS*

Extraction method: SW3050B Analytical methods: 6020A Work Order: 0601299

Lab ID	Client ID	Matrix	Extraction	Arsenic	DF	% SS
0601299-001A	SS-2 A-2'	S	TTLC	10	1	109
0601299-002A	SS-4 A-2'	S	TTLC	11	1	109
0601299-003A	SS-5 B-2'	S	TTLC	8.0	1	96
0601299-004A	SS-7 B-2'	S	TTLC	11	1	93
0601299-005A	SS-C 10-2'	S	TTLC	14	1	102
0601299-006A	SS-C 12-2'	S	TTLC	11	1	99
0601299-007A	SS-D 13-2'	S	TTLC	8.3	1	92
0601299-008A	SS-D 15-2'	S	TTLC	8.5	1	87

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	TTLC	NA	mg/L
	S	TTLC	0.5	mg/Kg

*water samples are reported in µg/L, product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

means surrogate diluted out of range; ND means not detected above the reporting limit; N/A means not applicable to this sample or instrument.

i) aqueous sample containing greater than ~1 vol. % sediment; for DISSOLVED metals, this sample has been preserved prior to filtration; for TTLC metals, a representative sediment-water mixture was digested; j) reporting limit raised due to insufficient sample amount; k) reporting limit raised due to matrix interference; m) estimated value due to low/high surrrogate recovery, caused by matrix interference; n) results are reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644

_____Angela Rydelius, Lab Manager

APPENDIX C

CCCHMP LETTER DATED JANUARY 25, 2006

WILLIAM B. WALKER, M.D.
HEALTH SERVICES DIRECTOR

RANDALL L. SAWYER
DIRECTOR

CONTRA COSTA
HEALTH SERVICES

HAZARDOUS MATERIALS PROGRAMS

4333 Pacheco Boulevard
Martinez, California
94553-2229
Ph (925) 646-2286
Fax (925) 646-2073

January 25, 2006

Mr. Jeremy Smith
AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597

Re: Agricultural Chemical Survey
Brentwood Blvd & Sand Creek Rd
Brentwood, CA
APN: 016-170-002, 003 and 010

Dear Mr. Smith

Contra Costa Health Services (CCHS) has reviewed the above referenced report as well as the report of January 24, 2006 documenting discrete arsenic sampling results in the soil. We find that the appropriate number of soil samples was taken and analyzed at a State-Certified laboratory.

There does not appear to be levels of agricultural chemicals that would pose a threat to human health or the environment. Therefore, CCHS requires no further action at this site. If you have any questions, please call this office at (925) 646-2286.

Sincerely,

Dena Hutchin

Dena Hutchin
Hazardous Materials Specialist

cc: Jessica Ward
City of Brentwood
Engineering Dept.
708 3rd St.
Brentwood, CA 94513

DH/am

AEI CONSULTANTS
ENVIRONMENTAL & CIVIL ENGINEERING

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Phone: (925) 283-6000 Fax: (925) 944-2895

September 20, 2007

New Urban Communities, LLC and
New Urban Communities / Sciortino, LLC

Subject: **Soil and Groundwater Investigation Report**
December 15, 2005
AEI Project No. 115132

The report titled *Soil and Groundwater Investigation Report* (Draft), dated December 15, 2005, is included with this Phase I Environmental Site Assessment for the subject property to provide details on the methods and results of the subsurface investigation relating to the onsite historical underground storage tanks (USTs) which reportedly existed onsite. These USTs and the December 15, 2005 report are discussed in Section 4.0 of the Phase I ESA report dated September 20, 2007. In addition, the December 15, 2005 report includes information relating to the adjacent property to the northeast owned by Delta Sierra, LLC. In consideration of this report and subsequent assessments, AEI has concluded that the subject property has not been adversely impacted from site conditions on the Delta Sierra, LLC parcel and no significant impacts are foreseeable due to the distance to the impacted areas and expected northerly groundwater flow direction.

I can be reached at 925/283-6000, extension 104 or at pmcintyre@aeiconsultants.com, if you have questions or need any additional information.

Sincerely,
AEI Consultants

Peter McIntyre, PG, REA
Senior Project Manager

December 15, 2005

SOIL & GROUNDWATER INVESTIGATION REPORT

Brentwood Blvd. & Sand Creek Road
Brentwood, California

Project No. 115132

Prepared For

Mr. Steven Thomas
c/o The Law Offices of Mr. Timothy L. Clack
2500 Old Crow Canyon Road, Suite 123
San Ramon, CA 94583

Prepared By

AEI Consultants
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AEI

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December 15, 2005

Mr. Steven Thomas
Thomas Properties
c/o Law Office of Mr. Timothy L. Clack
2500 Old Crow Canyon Road, Suite 123
San Ramon, CA 94583

Subject: **Soil & Groundwater Investigation**
Brentwood Blvd. & Sand Creek Road
Brentwood, California
AEI Project No. 115132

Dear Mr. Thomas:

This report describes the activities and results of the soil and groundwater investigation performed by AEI Consultants at the above referenced property (Figure 1: Site Location Map). The investigation was performed on behalf of Thomas Properties to investigate the following environmental concerns:

- if the shallow soils of the property have been impacted by the use of agricultural chemicals on the property,
- if underground storage tanks (USTs) reportedly used to store fuel for former farming activities at the site are still present at the subject site,
- if soil and groundwater in the vicinity of the USTs has been impacted by petroleum hydrocarbons, and
- if soil and groundwater in the northeast corner of the property has been impacted by natural gas production activities at the site.

1.0 SITE DESCRIPTION

The subject property is located on the east side of Brentwood Boulevard near its intersection with Sand Creek Road in a mixed agricultural, residential, and commercial area of Brentwood (Figure 1). The property totals approximately 66.94 acres and consists primarily of vacant land formerly used for agricultural purposes. A fenced area is located at the northeast corner of the subject property. Located in the fenced area are compressors, meters, condensate tanks, and piping associated with natural gas production. An inactive natural gas production well is also located at the northeast corner of the subject property. An active natural gas production well is located at the east side of the subject property. Residences and farming structures were formerly located at the west side of the subject property. Concrete pads associated with these former buildings remain in place at the west side of the subject property. The locations of current and former features at the site are shown on Figure 2 – Site Plan.

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The immediately surrounding properties consist of residences to the north; vacant land and natural gas production pump sites to the east; residences and vacant land to the south; and Sand Creek Plaza, Sand Creek Road and Brentwood Center beyond Brentwood Boulevard to the west.

2.0 INVESTIGATIVE ACTIVITES

2.1 Geophysical Survey

According to an interview conducted with the property owner, two fuel USTs were historically located north of the former residence and former farming structures (Figure 2). The exact location of the USTs, as well as if the USTs are still present was unknown to the property owner. Therefore, on November 3, 2005, AEI performed a geophysical survey at the site in an attempt to determine if the fuel USTs associated with historical farming activities are still present in the area north of the former residence and farming structures. The area was initially swept over using a reflective induction scan to identify any anomalies within the subsurface. The location of any anomalies was flagged, and these identified areas were swept over again using a magnetometer to identify any shallow metallic anomalies in the subsurface. A shovel was used to excavate the identified shallow anomalies to approximately 0.5 feet below ground surface (bgs) in an attempt determine the source of these anomalies. A detail of the surveyed area is shown on Figure 3.

On November 7, 2005 AEI performed additional excavations at the subject site to verify the findings of the geophysical survey. Several hand auger borings were advanced in the flagged subsurface anomalies areas to depths up to 3-4 feet bgs in an attempt to verify the presence of USTs at the site.

2.2 Agricultural Survey

AEI performed shallow soil sampling activities at the property on November 7 and 8, 2005. Soil sampling locations were chosen by first dividing the property into a grid of 64 evenly spaced squares with each square equal to approximately one acre (Figure 4). From each square, 1 soil sample was collected from the approximate center of the square. Soil samples from four adjacent acre squares were submitted to the laboratory who analyzed them as a composite sample. In addition, three discrete soil samples were collected from around the former farming structure based on the possibility of chemical mixing in that area.

The soil samples were collected from approximately 9 to 12 inches bgs, although the surface was uneven, having been recently plowed. In each location, a small pit was dug and soil was collected by driving brass liners into the base of the pit with a wooden mallet. The full liners were sealed with Teflon tape and plastic end caps. The samples were stored in a cooler and chain of custody was initiated.

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The samples were transported to McCampbell Analytical, Inc. of Pacheco, California (Department of Health Services Cert. # 1644). A total of 64 soil samples were collected and composited by the laboratory into 16 composite samples and 3 discrete samples. Each sample was analyzed for lead and arsenic by EPA method 6020A and for organochlorine (OC) pesticides by EPA method 8081B.

2.3 UST Investigation

2.3.1 Soil Sample Collection

Prior to mobilization onsite, a drilling permit (#05B-1697) was obtained from the Contra Costa County Environmental Health Division (CCCEHD), and Underground Service Alert North was notified to identify public utilities in the planned work area.

AEI performed the additional subsurface investigation at the property on November 14, 2005. A total of four (4) soil borings (SB-1 through SB-4) were advanced at the site. The borings were placed in an east/west transect north of the former residence and farming structures in the vicinity of the suspected location of the USTs and based on findings of the geophysical survey. The locations of the soil borings are shown on Figure 3.

The borings were advanced with a direct-push drilling rig and drilled to depths ranging from 20 to 30 feet bgs, depending on the depth to groundwater in each location. A soil core for boring SB-1 was continuously collected in 2" diameter acrylic liners and logged by the onsite AEI geologist until groundwater was encountered (approximately 27.5 feet bgs). Soil cores for the remainder of the borings were continuously collected and logged by AEI to a depth of 16 feet bgs. The remainder of each boring was advanced to approximately 20 to 30 feet bgs to facilitate groundwater collection only. At selected depths of the continuously cored borings, six-inch samples were cut from the liners. Soil samples were screened in the field with a portable organic vapor meter (OVM). Soil samples were collected at approximately 2 to 5 foot intervals. Selected samples were sealed with Teflon tape and plastic caps, labeled with a unique identifier, placed in a cooler filled with ice, and transported to an offsite laboratory.

Field observations and screening data is presented on the borings logs in Appendix A.

2.3.2 Groundwater Sample Collection

Upon encountering saturated sediments, a temporary ¾" diameter factory-slotted poly-vinyl chloride (PVC) casing was inserted into the borings to help facilitate the collection of groundwater samples.

Groundwater samples were collected with a dedicated, disposable bailer and decanted into 40-ml volatile organic analysis (VOA) vials and 1 liter bottles. The groundwater samples were capped

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so that there was no head space or visible air bubbles within the vials, labeled with a unique identifier, placed in a cooler filled with ice, and transported to an offsite laboratory.

Upon completion of sampling and measurement activities, all temporary casing was removed from the boreholes. Each boring was then backfilled with neat cement grout, as required by the CCCEHD permit, to the existing grade. Soil and groundwater samples were transported to McCampbell Analytical Inc. under chain of custody protocol for analysis.

Select soil and groundwater samples were analyzed for total petroleum hydrocarbons as diesel (TPHd) by EPA Method 8015 and TPH as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (collectively referred to as BTEX), and methyl tertiary butyl ether (MTBE) by EPA Method 8015/8021B.

2.4 Natural Gas Production Well/Area Investigation

2.4.1 Shallow Soil Sample Collection

On November 15, 2005, AEI mobilized to the site in order to collect shallow soil samples from select areas in the northeast corner of the property where natural gas production activities have and are currently occurring, as well as near the active natural gas well at the site. Soil sample locations were determined based on field observations and were collected adjacent to the onsite AST, onsite storage drums, and former and current condensate tanks. The location of the soil samples are shown on Figures 2 and 5.

The soil samples were collected from approximately 9 to 12 inches bgs, depending on the depth to native soil. In each location, a small pit was dug and soil was collected by driving brass liners into the base of the pit with a mallet. The full liners were sealed with Teflon tape and plastic end caps. The samples were stored in a cooler and chain of custody was initiated. Soil samples were analyzed for TPH as motor oil (TPHmo), TPHd, and TPHg by EPA Method 8015. Two of the soil samples were additionally analyzed for volatile organic compounds (VOCs) using EPA Method 8260B. In addition, one (4-part) composite soil sample was collected from four random locations throughout the fenced area. The composite soil sample was analyzed for OC pesticides by EPA method 8081B and chlorinated herbicides by EPA Method 8151A.

2.4.2 Additional Soil Sample Collection

Prior to mobilization onsite, a drilling permit (#05B-1772) was obtained from the CCCEHD, and AEI personnel met with a field representative from Beneco Inc. to verify that underground utilities were not present in the planned work area.

AEI performed the additional subsurface investigation at the property on December 12, 2005. A total of nine (9) soil borings (SB-14 through SB-22) were advanced at the site. The borings were

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placed in the vicinity and surrounding the current and former condensate tanks. The locations of the soil borings are shown on Figure 5.

The borings were advanced with a direct-push drilling rig and drilled to depths ranging from 12 to 19 feet bgs, depending on the depth to groundwater at each location. Soil cores for borings SB-14 through SB-21 were continuously collected in 2" diameter acrylic liners and logged by the onsite AEI geologist. Boring SB-22 was advanced to a depth of approximately 17 feet bgs utilizing a hydro-punch and soil samples were not collected or logged. At selected depths of the continuously cored borings, six-inch samples were cut from the liners. Select soil samples were screened in the field with a portable organic vapor meter (OVM). Soil samples were collected at approximately 2 to 5 foot intervals. Selected samples were sealed with Teflon tape and plastic caps, labeled with a unique identifier, placed in a cooler filled with ice, and transported to an offsite laboratory.

Field observations and screening data is presented on the borings logs in Appendix A.

2.4.3 Groundwater Sample Collection

A groundwater sample was collected from select borings. In borings were a groundwater sample was to be collected, upon encountering saturated sediments, a temporary ¾" diameter factory-slotted PVC casing was inserted into the borings to help facilitate the collection of groundwater samples. The groundwater sample collected from SB-22 was collected utilizing hydro-punch technology. After the hydro-punch probe was advanced to approximately 17 feet bgs, the probe was lifted to expose approximately 3 feet of screened material to facilitate groundwater collection.

Groundwater samples were collected with a dedicated, disposable bailer or disposable tubing and decanted into 40-ml VOA vials and 1 liter bottles. The groundwater samples were capped so that there was no head space or visible air bubbles within the vials, labeled with a unique identifier, placed in a cooler filled with ice, and transported to an offsite laboratory.

Upon completion of sampling and measurement activities, all temporary casing was removed from the boreholes. Each boring was then backfilled with neat cement grout, as required by the CCCEHD permit, to the existing grade. Soil and groundwater samples were transported to McCampbell Analytical Inc. under chain of custody protocol for analysis.

Select soil and groundwater samples were analyzed for TPHmo, TPHd, and TPHg by EPA Method 8015 and BTEX and MTBE by EPA Method 8015/8021B. One groundwater sample was additionally analyzed for semi-volatile organic compounds (SVOCs) using EPA Method 8270.

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3.0 FINDINGS

3.1 Geophysical Survey

The initial sweep of the suspected UST locations at the subject site indicated three likely locations as areas that could contain USTs (Figure 3). The locations were flagged out and based on the shape of subsurface anomalies, it was determined that the location furthest to the east exhibited characteristics similar to existing USTs. The second sweep for shallow anomalies performed over the three areas revealed several shallow anomalies within the flagged areas. Following a shallow excavation of these areas, miscellaneous metal debris was discovered in the two flagged areas to the west. Metal debris was not discovered in the flagged area to the east, confirming the likelihood of existing USTs in this location. The geophysical survey suggested that USTs may be present in the easternmost flagged area of the site.

The subsequent AEI hand auger borings on November 7, 2005 did not encounter any USTs or associated UST structures. Therefore the presence of the USTs could not be verified by AEI. In addition, the AEI soil borings did not encounter any of the possible USTs at the site.

3.2 Agricultural Survey

Both lead and arsenic were detected in all of the soil samples above laboratory detection limits. Lead was detected ranging from 18 milligrams per kilogram (mg/kg) to 110 mg/kg, with an average of 41.37 mg/kg. Arsenic concentrations ranged from 13 mg/kg to 19 mg/kg, with an average of 15.21 mg/kg. The pesticides dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDT) were both detected in several of the samples with DDE concentrations ranging from 0.015 mg/kg to 0.14 mg/kg, with an average of 0.035 mg/kg and DDT concentrations ranging from 0.0022 mg/kg to 0.043 mg/kg with an average of 0.0107 mg/kg. Pesticides a-chlordane and g-chlordane were detected in one soil sample, SS-17, at a concentration of 0.020 mg/kg and 0.011 mg/kg, respectively. The remainder of the pesticides were not detected at or above laboratory detection limits. Analytical results are presented in Table 1 and a copy of the analytical report with chain of custody documents is included as Appendix B

3.3 UST Investigation

TPHd, TPHg, BTEX, and MTBE were not detected at or above the laboratory detection limit in any of the soil or groundwater samples collected in the vicinity of the suspected USTs. Analytical results are presented in Tables 2 and 3 and a copy of the analytical report with chain of custody documents is included as Appendix B.

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3.4 Natural Gas Production Area Investigation

3.4.1 Shallow Soil Samples

TPHmo, TPHd, and TPHg were detected in several of the soil samples collected. TPHmo was detected in three of the samples at concentrations ranging from 5.6 mg/kg to 47 mg/kg, TPHd was detected in six of the samples at concentrations ranging from 1.0 mg/kg to 3,100 mg/kg, and TPHg was detected in five of the soil samples at concentrations ranging from 4.2 mg/kg to 11,000 mg/kg. VOCs were detected in one of the two soil samples analyzed (SB-10-12"). VOCs detected included BTEX at a concentration of 14 mg/kg, 88 mg/kg, 26 mg/kg, and 290 mg/kg, respectively. OC pesticides and chlorinated herbicides were not detected at or above the laboratory detection limit in the composite sample. Analytical results are presented in Table 2 and a copy of the analytical report with chain of custody documents is included as Appendix B.

3.4.2 Additional Soil Samples

TPHmo, TPHd, TPHg, and BTEX were detected in several of the soil samples as follows:

- TPHmo was detected in four of the soil samples at concentrations ranging from 6.3 mg/kg (SB-19-12) to 11 mg/kg (SB-14-12).
- TPHd was detected in each of the soil samples at concentrations ranging from 6.3 mg/kg (SB-18-8) to 1,700 mg/kg (SB-15-12).
- TPHg was detected in each of the soil samples at concentrations ranging from 26 mg/kg (SB-18-8) to 10,000 mg/kg (SB-15-12).
- Benzene was detected in two of the soil samples at a concentration of 0.0071 mg/kg (SB-18-8) and 110 mg/kg (SB-15-12).
- Ethylbenzene was detected in several of the soil samples at concentrations ranging from 0.056 mg/kg (SB-20-11) to 210 mg/kg (SB-15-12).
- Xylenes were detected in four of the soil borings at concentrations ranging from 0.16 mg/kg (SB-18-8) to 1,200 mg/kg (SB-15-12).
- Toluene and MTBE were not detected at or above the laboratory detection limit in any of the soil samples analyzed.

3.4.3 Groundwater Samples

TPHmo, TPHd, TPHg, and BTEX were detected in several of the groundwater samples as follows:

- TPHmo was detected in one groundwater sample (SB-14) at a concentration of 2,700 µg/L.
- TPHd was detected in the groundwater samples analyzed at concentrations ranging from 19,000 µg/L (SB-21 and SB-22) to 100,000 µg/L (SB-14).

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- TPHg was detected in the groundwater samples analyzed at concentrations ranging from 2,200 µg/L (SB-22) to 65,000 µg/L (SB-14).
- Benzene was detected in the groundwater samples from SB-14, SB-17, and SB-19 at concentrations of 1,900 µg/L, 22 µg/L, 46 µg/L, respectively.
- Toluene was detected in one groundwater sample (SB-14) at a concentration of 3,000 µg/L.
- Ethylbenzene was detected in several of the groundwater samples at concentrations ranging from 34 µg/L (SB-20) to 2,000 µg/L (SB-14).
- Xylenes were detected in the groundwater samples at concentrations ranging from 3.7 µg/L (SB-22) to 12,000 µg/L (SB-14).
- MTBE was not detected at or above the laboratory detection limit in any of the groundwater samples analyzed.

4.0 SUMMARY AND CONCLUSIONS

At the request of Thomas Properties, AEI performed the subsurface environmental assessment activities of several concerns at the subject property as AEI understands that the property is being considered for residential development. The following is a summary of the investigations performed at the site, as well as AEI's conclusions based on the findings.

4.1 Geophysical Survey & UST Investigation

The initial geophysical survey concluded that the USTs were likely present in the easternmost flagged area at the site (Figure 3). Following several hand auger borings and direct push borings, the USTs were not encountered. It is unknown if the USTs are present at the site, however, soil and groundwater samples collected along the transect of probable UST location did not contain hydrocarbons at or above the laboratory detection limits. Based on the laboratory results, it does not appear there has been a significant release. Although their presence could not be confirmed, the USTs may exist. During development, if USTs are encountered, the USTs should be removed under the appropriate permits.

4.2 Agricultural Survey

Sample results indicate that the pesticides DDE and DDT are present in the majority of the soil samples collected. DDE and DDT were reported at concentrations ranging from 0.015 mg/kg to 0.14 mg/kg and 0.0022 mg/kg to 0.043 mg/kg, respectively. These concentrations are well below the respective Environmental Screening Level (ESL) of 1.6 mg/kg for DDE and DDT. In addition, a-chlordane and g-chlordane were detected in one soil sample (SB-17), however the detected concentrations of a-chlordane and g-chlordane (0.020 mg/kg and 0.011 mg/kg, respectively) were well below the ESL for chlordane of 0.44 mg/kg (an ESL for a-chlordane and g-chlordane has not been established). ESLs are established by the Regional Water Quality Control Board (RWQCB) and for the purposes of this report based on residential land use where groundwater is a potential source of drinking water (Tables A, SBR RWQCB, February 2005).

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The low concentration of DDE, DDT, a-chlordane, and g-chlordane present in the soil do not appear to pose a risk to human health or the environment.

Lead and arsenic were also present in the soil samples collected. Lead was present at concentrations ranging from 18 mg/kg to 110 mg/kg, below the ESL for lead of 150 mg/kg, and does not appear to pose a risk to human health or the environment. Arsenic was present at concentrations ranging from 13 mg/kg to 19 mg/kg, above the ESL for arsenic of 5.5 mg/kg. Based on the universal presence of arsenic in the soil samples at concentrations deviating less then 4 mg/kg from the average concentration of 15.21 mg/kg, AEI suspects that arsenic is a naturally occurring element in the soil at the subject site, and remediation of the arsenic is not warranted. In addition, naturally occurring arsenic has been documented throughout the bay area at concentrations up to 20 mg/kg.

Due to the presence of the detected pesticides, lead, and arsenic, these findings should be presented to the local health department for review and concurrence that their presence will not impede residential development.

4.3 Natural Gas Production Area Investigation

Shallow soil samples collected within the natural gas production area, with the exception of the southwestern corner, do not appear to contain contaminates at concentrations that represent a significant threat to human health or the environment. Petroleum hydrocarbons as TPHg, TPHd, and TPHmo were reported in one sample (SB-5-2.5) at concentrations less then 10 mg/kg, well below the respective ESLs.

Soil samples collected in the southwestern portion of the natural gas production area near the former and current condensate tanks have elevated hydrocarbon concentrations, indicating a significant release occurred in this area. TPHmo, TPHd, and TPHg were detected in soil samples at concentrations up to 47 mg/kg, 3,100 mg/kg, and 11,0000 mg/kg, respectively. Numerous soil samples contained concentrations of TPHd and TPHg above their respectively ESL of 100 mg/kg. In addition, BTEX constituents were detected in one or more soil samples at concentrations exceeding their respective ESL.

Groundwater samples collected in the immediate vicinity of the former and current condensate tanks (SB-14, SB-17, SB-19, SB-20, and SB-21) also contain elevated concentrations of hydrocarbons indicating significant impact to groundwater beneath the site. TPHmo, TPHd, and TPHg were detected at concentrations up to 2,700 µg/L, 100,000 µg/L. and 65,000 µg/L, respectively. TPHmo in SB-14 and TPHd and TPHg in each of the analyzed groundwater samples were reported above the ESL for TPHmo, TPHd and TPHg of 100 µg/L. In addition BTEX constituents were detected at concentrations up to 1,900 µg/L, 3,000 µg/L, 2,000 µg/L, and 12,000 µg/L**,** respectively. Each of the groundwater samples, contained at least one BTEX constituent above their respective ESL. One groundwater sample (SB-22) was collected approximately 65 feet east of the current condensate tank berm area. The groundwater sample from SB-22 was detected concentrations of TPHd and TPHg at 19,000 µg/L and 2,200 µg/L,

respectively. Based this, along with data and observations from other borings, a dissolved phase hydrocarbon plume has migrated from the release area.

Based on the results of this investigation, a significant release of petroleum hydrocarbons has occurred to soil and groundwater in the southwestern portion of the fenced area. The release consists of gasoline and diesel range hydrocarbons, apparently well gas condensate which was piped to the storage tanks. The extent of impacted soil above the capillary fringe is relatively well defined based on this investigation; however the extent of impacted groundwater is not yet known.

Further investigation of the extent of impacted groundwater will be necessary to better understand to what extent groundwater treatment may be needed. Prior to the development of this portion of the property, soil and groundwater remediation will be required, along with a follow-up groundwater monitoring program.

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5.0 REPORT LIMITATION

This report presents a summary of work completed by AEI Consultants. The completed work includes observations and descriptions of site conditions encountered. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide the required information, but it cannot be assumed that they are representative of areas not sampled. All conclusions and/or recommendations are based on these analyses and observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document.

These services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work.

If you have any questions regarding our investigation, please do not hesitate to contact the undersigned at (925) 283-6000.

Sincerely,
AEI Consultants

DRAFT

Jeremy Smith
Project Manager

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Peter J. McIntyre, P.G.
Senior Geologist

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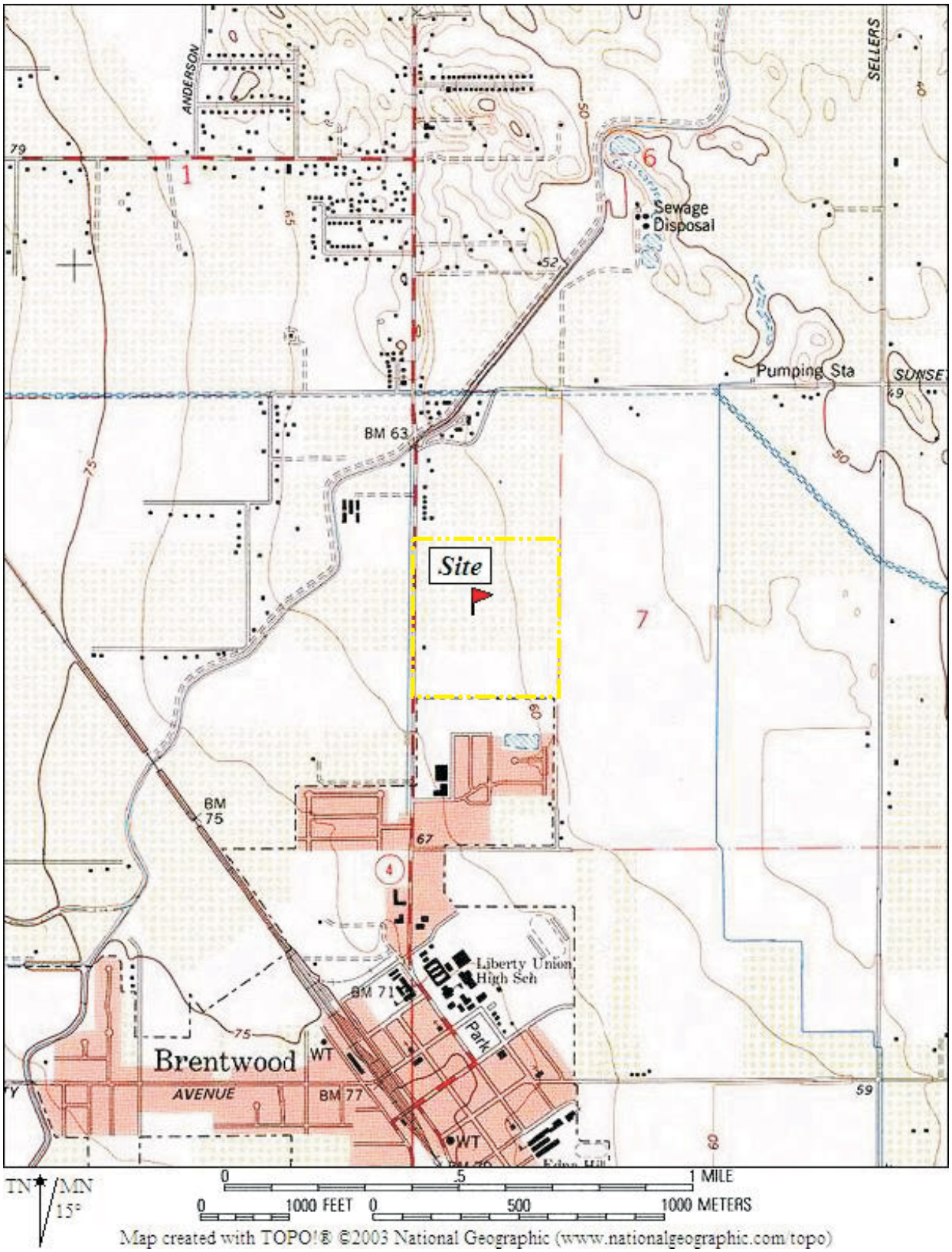
FIGURES



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

USGS TOPOGRAPHIC MAP
BRENTWOOD QUADRANGLE
Created 1975 Revised 1978

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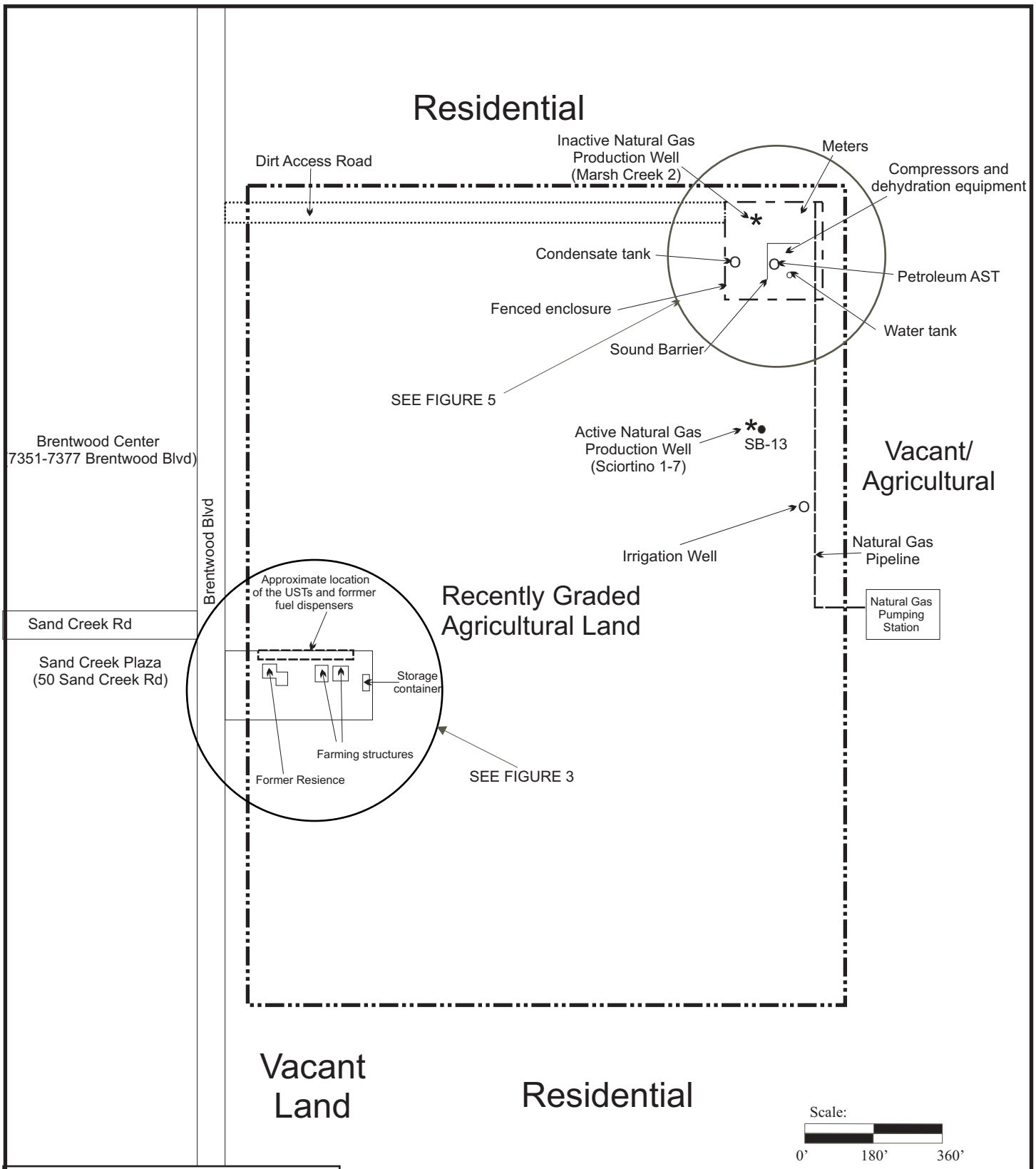
2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597

SITE LOCATION PLAN

Brentwood Blvd and Sand Creek Rd
Brentwood, CA

FIGURE 1
Job No: 12639



LEGEND

N

Subject Property Line

Soil Boring

Natural Gas Production Well

Dirt Access Road

Natural Gas Pipeline

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2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597

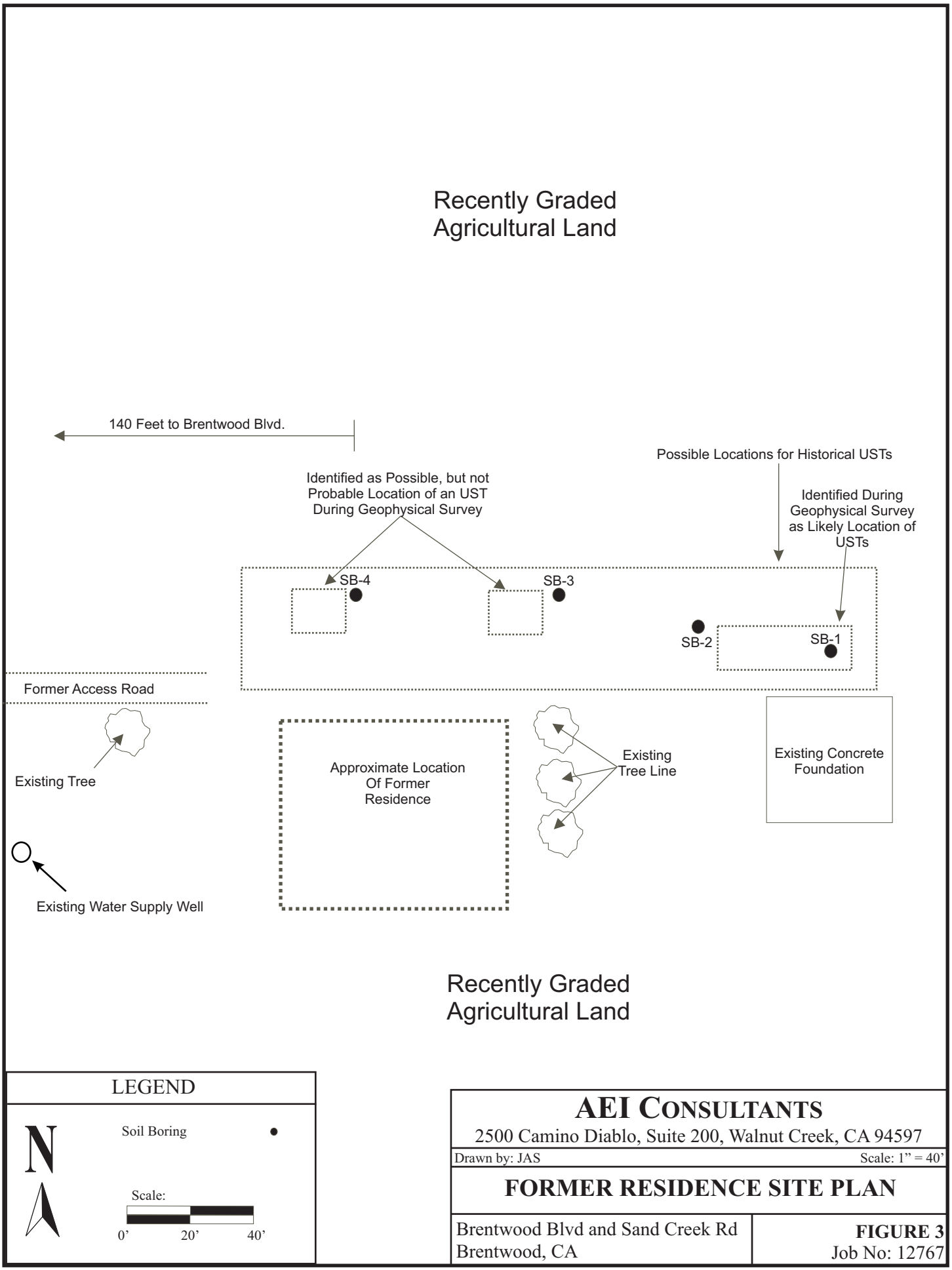
Drawn by: SS revised by JAS

Scale: 1" = 360'

SITE PLAN

Brentwood Blvd and Sand Creek Rd
Brentwood, CA

FIGURE 2
Job No: 12767



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Drawn by: JAS

Scale: 1" = 40'

FORMER RESIDENCE SITE PLAN

Brentwood Blvd and Sand Creek Rd
Brentwood, CA

FIGURE 3
Job No: 12767

Scale:

0' 180' 360'

LEGEND

N

Soil Sampling Location

One Acre Square Grid

Composite Sample Boundary

Property Boundary

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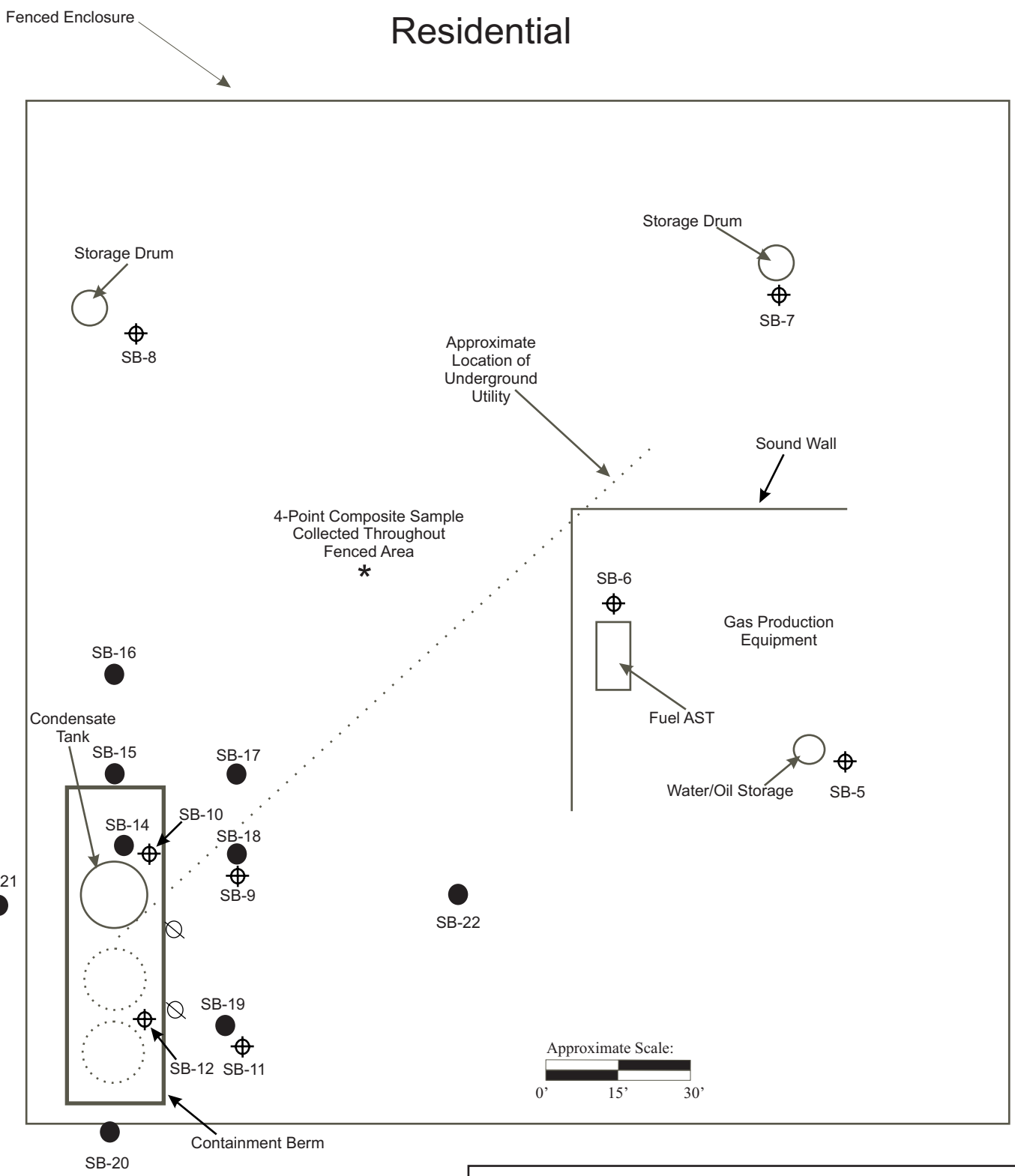
Drawn by: JAS

Scale: 1" = 360'

AGRICULTURAL SURVEY SOIL SOIL SAMPLE LOCATIONS

Brentwood Blvd and Sand Creek Rd
Brentwood, CA

FIGURE 4
Job No: 12767



LEGEND

N

Shallow Boring Nov. 5, 2005	⊕
Deep Soil Boring Dec. 12, 2005	●
4-Point Composite Sample	*
Former Condensate Tank	⊘
Buried 55-Gallon Drum	⊘

AEI CONSULTANTS

2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597

Drawn by: JAS

Scale: 1"= Approximately 30'

NATURAL GAS PRODUCTION AREA-SOIL SAMPLE LOCATIONS

Brentwood Blvd and Sand Creek Rd
Brentwood, CA

FIGURE 5
Job No: 12767

TABLES

TABLE 1

Brentwood Blvd. & Sand Creek Road

Brentwood, California

Soil Sample Analytical Results - Agricultural Survey

Sample ID	Aldrin	a-BHC	b-BHC	d-BHC	g-BHC	Chlordane	a-Chlordane	g-Chlordane	p,p'-DDD	p,p'-DDE	p,p'-DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan Sulfate	Endrin	Endrin Aldehyde	Heptachlor Epoxide	Heptachlor	Methoxychlor	Toxaphene	**Lead**	**Arsenic**
	mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
	Organochlorine Pesticides EPA method 8081B																					***EPA 6020A***	
SS-1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.031**	**0.0048**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**47**	**17**
SS-2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.023**	**0.0035**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**38**	**16**
SS-3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.017**	**0.0023**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**29**	**15**
SS-4	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.015**	**0.0022**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**33**	**15**
SS-5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.021**	**0.0028**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**34**	**15**
SS-6	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.028**	**0.0041**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**39**	**17**
SS-7	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.031**	**0.0046**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**40**	**16**
SS-8	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.022**	**0.0039**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**32**	**15**
SS-9	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.016**	**0.0023**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**33**	**15**
SS-10	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.019**	**0.0031**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**28**	**14**
SS-11	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.016**	**0.0022**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**30**	**15**
SS-12	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.015**	**0.0027**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**25**	**13**
SS-13	<0.010	<0.010	<0.010	<0.010	<0.010	<0.25	<0.010	<0.010	<0.010	**0.14**	**0.043**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.50	**22**	**15**
SS-14	<0.010	<0.010	<0.010	<0.010	<0.010	<0.25	<0.010	<0.010	<0.010	**0.087**	**0.024**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.50	**22**	**15**
SS-15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.068**	**0.032**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**18**	**14**
SS-16	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	**0.056**	**0.016**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	**19**	**15**
SS-17	<0.010	<0.010	<0.010	<0.010	<0.010	<0.25	**0.020**	**0.011**	<0.010	**0.023**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.50	**110**	**19**
SS-18	<0.020	<0.020	<0.020	<0.020	<0.020	<0.50	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<1.0	**77**	**14**
SS-19	<0.020	<0.020	<0.020	<0.020	<0.020	<0.50	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<1.0	**110**	**14**
Average	-	-	-	-	-	-	-	-	-	**0.035**	**0.0107**	-	-	-	-	-	-	-	-	-	-	**41.37**	**15.21**
ESL	-	-	-	-	-	-	**0.44***	**0.44***	-	**1.6**	**1.6**	-	-	-	-	-	-	-	-	-	-	**150**	**5.5**

mg/kg = milligrams per kilogram (parts per million)

ESL = Environmental Screening Level for shallow soil where groundwater is a potential drinking water source as determined by the Regional Water Quality Control Board San Francisco Bay Region - Residential Land Use

* = ESL for a-chlordane and g-chlordane has not been determined and is based on the ESL for chlordane (0.44 mg/kg).

Table 2

Brentwood Blvd & Sand Creek Road

Brentwood, California

Soil Sample Analytical Results - UST/Natural Gas Production Area

Sample ID	Date	Sample Depth (feet bgs)	TPHmo mg/kg	TPHd mg/kg	TPHg mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	1,2,4-Trimethylbenzene mg/kg	1,3,5-Trimethylbenzene mg/kg	Naphthalene mg/kg	Chlorinated Herbicides mg/kg	Organochlorine Pesticides mg/kg	Remaining VOCs mg/kg
November 14, 2005 Geoprobe Investigation - Suspected UST Locations																
SB-1-16	11/14/2005	16	NA	ND<1.0	ND<1.0	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005	NA	NA	NA	NA	NA	NA
SB-2-16	11/14/2005	16	NA	ND<1.0	ND<1.0	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005	NA	NA	NA	NA	NA	NA
SB-3-16	11/14/2005	16	NA	ND<1.0	ND<1.0	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005	NA	NA	NA	NA	NA	NA
SB-4-16	11/14/2005	16	NA	ND<1.0	ND<1.0	ND<0.05	ND<0.005	ND<0.005	ND<0.005	ND<0.005	NA	NA	NA	NA	NA	NA
November 15, 2005 Shallow Hand Auger Borings																
SB-5-2.5"	11/15/2005	0.2	**7.4**	**2.6**	**4.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-6-6"	11/15/2005	0.5	ND<5.0	ND<1.0	ND<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-7-12"	11/15/2005	1	ND<5.0	ND<1.0	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<1.0	ND<1.0	ND<1.0	NA	NA	ND*
SB-8-8"	11/15/2005	0.67	ND<5.0	ND<1.0	ND<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-9-10"	11/15/2005	0.83	ND<250	**2,200**	**5,100**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-10-12"	11/15/2005	1	ND<250	**3,100**	**11,000**	ND<10	**14**	**88**	**26**	**290**	**48**	**30**	**11**	NA	NA	ND*
SB-11-12"	11/15/2005	1	ND<100	**990**	**2,800**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-12-10"	11/15/2005	0.83	**47**	**400**	**72**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-13-6"	11/15/2005	0.5	**5.6**	**1.0**	ND<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comp 1-4	11/15/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND*	ND*	NA
December 12, 2005 Geoprobe Investigation - Natural Gas Production Area																
SB-14-8	12/12/2005	8	ND<5.0	**40**	**150**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-14-12	12/12/2005	12	**11**	**390**	**1,900**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-15-4	12/12/2005	4	ND<5.0	**140**	**1,100**	ND<5.0	ND<0.50	ND<0.50	**18**	**89**	NA	NA	NA	NA	NA	NA
SB-15-12	12/12/2005	12	ND<100	**1,700**	**10,000**	ND<50	**110**	ND<5.0	**210**	**1,200**	NA	NA	NA	NA	NA	NA
SB-16-12	12/12/2005	12	ND<5.0	**51**	**130**	ND<1.0	ND<0.10	ND<0.10	**2.8**	ND<0.10	NA	NA	NA	NA	NA	NA
SB-17-8	12/12/2005	8	ND<5.0	**20**	**78**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-17-12	12/12/2005	12	ND<50	**570**	**1,800**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-18-8	12/12/2005	8	ND<5.0	**6.3**	**26**	ND<0.05	**0.0071**	ND<0.005	**0.76**	**0.16**	NA	NA	NA	NA	NA	NA
SB-18-12	12/12/2005	12	**6.7**	**230**	**270**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-19-8	12/12/2005	8	ND<100	**1,100**	**1,000**	ND<5.0	ND<0.50	ND<0.50	**3.3**	ND<0.50	NA	NA	NA	NA	NA	NA
SB-19-12	12/12/2005	12	**6.3**	**200**	**400**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-20-11	12/12/2005	11	ND<5.0	**12**	**27**	ND<0.05	ND<0.005	ND<0.005	**0.056**	ND<0.005	NA	NA	NA	NA	NA	NA
SB-21-8	12/12/2005	8	**19**	**890**	**560**	ND<10	ND<1.0	ND<1.0	**3.4**	**6.4**	NA	NA	NA	NA	NA	NA
ESL	--	--	**500**	**100**	**100**	**0.023**	**0.044**	**2.9**	**3.3**	**2.3**	--	--	**0.46**	--	--	--

Notes:

TPHmo = total petroleum hydrocarbons as motor oil (C18+)

TPHd = total petroleum hydrocarbons as diesel (C10-C23)

TPHg = total petroleum hydrocarbons as gasoline (C6-C12)

bgs = below ground surface

MTBE = methyl tert-butyl ether

ND = Not detected at or above the indicated Method Detection Limit

NA = not analyzed

mg/kg = milligrams per kilogram (ppm)

* = For a complete list of compounds and detection limits, see laboratory report

Table 3

Brentwood Blvd & Sand Creek Road

Brentwood, California

Groundwater Sample Analytical Results - UST/Natural Gas Production Area

Sample ID	Date	TPHmo µg/L	TPHd µg/L	TPHg µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L
November 14, 2005 Geoprobe Investigation - Suspected UST Locations									
SB-1	11/14/2005	NA	ND<50	ND<50	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB-2	11/14/2005	NA	ND<50	ND<50	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB-3	11/14/2005	NA	ND<50	ND<50	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
SB-4	11/14/2005	NA	ND<50	ND<50	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
December 12, 2005 Geoprobe Investigation - Natural Gas Production Area									
SB-14	12/12/2005	**2,700**	**100,000**	**65,000**	ND<500	**1,900**	**3,000**	**2,000**	**12,000**
SB-17	12/12/2005	ND<2,500	**28,000**	**26,000**	ND<170	**22**	ND<17	**1,700**	**4,400**
SB-19	12/12/2005	NA	NA	**32,000**	ND<100	**46**	ND<10	**940**	**3,200**
SB-20	12/12/2005	NA	NA	**6,200**	ND<25	ND<2.5	ND<2.5	**34**	**8.0**
SB-21	12/12/2005	ND<2,500	**19,000**	**12,000**	ND<50	ND<5.0	ND<5.0	**720**	**1,300**
SB-22	12/12/2005	ND<2,500	**19,000**	**2,200**	ND<25	ND<2.5	ND<2.5	ND<2.5	**3.7**
ESL	**--**	**100**	**100**	**100**	**5.0**	**1.0**	**40**	**30**	**20**

Notes:

TPHmo = total petroleum hydrocarbons as motor oil (C18+)

TPHd = total petroleum hydrocarbons as diesel (C10-C23)

TPHg = total petroleum hydrocarbons as gasoline (C6-C12)

MTBE = methyl tert-butyl ether

ND = Not detected at or above the indicated Method Detection Limit

NA = Not Analyzed

µg/L = micrograms per liter (ppb)

APPENDIX A

BORING LOGS

Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-1** Sheet 1 of 1

Date(s) Drilled **November 14, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **28 feet bgs**
Drill Rig Type **Truck mounted 5410**	Drilling Contractor **Vironex**	Approximate Surface Elevation
Groundwater Level and Date Measured **27.5 feet ATD, 16.2 feet after 10 minutes**	Sampling Method(s) **None**	Well Permit.
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			ML		Clayey silt, brown (10RY 4/3), (0,10,90), some fined grained sand, moist, medium stiff, non-cohesive	<1	
	5			ML		Increased clay content, some co-hesiveness	<1	
				ML		Increased fine grained sand (0,30,70)		
	10			SP		Poorly graded sand, dark yellowish brown (10YR 4/4), (0,95,5), fine grained sand with trace coarse sand, moist, medium density (poor recovery)	<1	
				CL		Silty Clay, dark yellowish brown (10YR 4/4) (0,0,100), medium plasticity, co-hesive, moist to very moist, stiff		
				CL		moist, stiff with soft lens from 13 to 13.5		
	15		SB-1-16				<1	
				SC		(after 10 minutes) ▼ sandy clay/clayey sand, dark yellowish brown (10YR 4/4) (5,50,45), fine grained sand with trace fine gravel (subangular), moist to very moist		
				CL		Silty clay, dark yellowish brown (10YR 4/4) (0,0,100) non-plastic, very stiff, moist	<1	
	20			CL		Sandy Clay, dark yellowish brown (10YR 4/4) (0,40,60) fine grained sand, moist	<1	
				CL		Silty clay, dark yellowish brown (10YR 4/4), (0,0,100), medium plasticity, moist, stiff		
	25						<1	Boring Terminated at 28 feet bgs. Temporary PVC casing set.
				SC		(ATD) ▽ Clayey sand, dark yellowish brown (10YR 4/4), (0,60,40), fine grained sand, wet		
	30							

Figure

X:\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (AEI geoprobe 28.tpl)

Project: Thomas Properties Project Location: Brentwood Blvd. & Sand Creek Road Project Number: 115132	**Log of Boring SB-2** Sheet 1 of 1

Date(s) Drilled **November 14, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **16 feet bgs**
Drill Rig Type **Truck mounted 5410**	Drilling Contractor **Vironex**	Approximate Surface Elevation
Groundwater Level and Date Measured **11 feet after 10 minutes**	Sampling Method(s) **None**	Well Permit.
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			ML		Clayey silt, brown (10YR 4/3) (0,10,90), some fine grained sand, non-cohesive, stiff, moist	<1	
	5			ML		Increased clay content, very stiff (0,0,100)	<1	
	10			CL		Silty clay, dark yellowish brown (10YR 4/4), (0,0,100), low plasticity, moist, very stiff (after 10 minutes) ▼	<1	
				SC		clayey sand, dark yellowish brown (10YR 4/4) (0,60,40), fine grained sand, moist to very moist		
				CL		Silty clay, dark yellowish brown (10YR 4/4), (0,0,100), medium to high plasticity, moist, medium stiff		
	15		SB-2-16				<1	
						Log terminated at 16 feet bgs. Push to 30 feet bgs and set casing. Groundwater measured at 11 feet bgs.		
	20							

Figure

\\Aei-nas1\data\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (AEI geoprobe 20.tpl)

Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-3** Sheet 1 of 1

Date(s) Drilled **November 14, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **16 feet bgs**
Drill Rig Type **Truck mounted 5410**	Drilling Contractor **Vironex**	Approximate Surface Elevation
Groundwater Level and Date Measured **14 feet ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			ML		Clayey silt, brown (10YR 4/3), (0,10,90), some fine grained sand, non-plastic, non-cohesive, stiff, moist	<1	
				ML		Increased clay content (0,0,100), low plasticity	<1	
	5							
				CL		Silty clay, brown (10YR 4/3), (0,0,100), low plasticity, stiff, moist	<1	
	10							
				CL		wet, medium plasticity (ATD) ▽		
	15			CL		Moist		
			SB-3-16				<1	
						Log terminated at 16 feet bgs, pushed to 30 foot bgs and set temporary PVC casing. GW not initially present, but measured at approximately 26 feet bgs after 30 minutes.		
	20							

Figure

\\Aei-nas1\data\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-4** Sheet 1 of 1

Date(s) Drilled **November 14, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **16 feet bgs**
Drill Rig Type **Truck mounted 5410**	Drilling Contractor **Vironex**	Approximate Surface Elevation
Groundwater Level and Date Measured **10.9 feet after 10 minutes**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0			ML		Clayey silt, brown (10YR 4/3), (0,10,90), some fine grained sand, non-cohesive, moist, stiff	<1	
				ML		Increased clay content, low plasticity, medium stiff from 6-8 feet		
	5						<1	
				CL		Silty clay, dark yellowish brown (10YR 4/4), (0,0,100), low plasticity, stiff, moist		
	10					(after 10 minutes) ▼	<1	
				CL CL		Soft and very moist lens from 13 to 13.25 Very stiff, moist		
	15		SB-4-16				<1	
						Log terminated at 16 feet bgs, boring pushed to 20 feet bgs and temporary PVC casing set. Groundwater encountered at 10.9 feet after 10 minutes.		
	20							

Figure

\\Ael-nas1\data\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-14** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **19 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **15.5 feet ATD, 14 feet after 5 minutes**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Gravel and Fill		
				SP		Poorly graded sand (Fill), dark grey (2.5Y 4/1) (0,100,0), fine grained sand, moist, strong hydrocarbon odor	1,148	
	5		SB-14-8	CL		Silty clay, very dark greyish brown (2.5Y 3/1) (0,5,95), low plasticity, moist, stiff, strong hydrocarbon odor	71.5	
	10		SB-14-12	CL		Increased silt, medium plasticity	571	
				CL		increase in fine grained sand (0,20,80) (after 5 minutes) ▼	516	
	15			SP		(ATD) ▽ Poorly graded sand, very dark greyish brown (2.5Y3/1) (0,100,0) fine grained sand, saturated	3.5	
				SP		Becomes yellowish brown (10YR 5/8), very moist to wet.		
	20					Boring Terminated at 19 feet bgs		

Figure

X:\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

Project: Thomas Properties Project Location: Brentwood Blvd. & Sand Creek Road Project Number: 115132	**Log of Boring SB-15** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **15 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **14 feet ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Gravel and Fill		
				SP		Poorly graded sand (Fill), dark grey (2.5Y 4/1) (0,100,0), fine grained sand, moist, strong hydrocarbon odor		
			SB-15-4	CL		Silty clay, dark grey brown (2.5Y 3/1) (0,5,95), low plasticity, moist, stiff, strong hydrocarbon odor	1,131	
	5						1,050	
	10			CL		Increased silt and lenses of fine grained sand		
			SB-15-12				1,370	
							1,050	
				SP		(ATD) ▽ Poorly graded sand, dark grey (2.5Y4/1) (0,100,0) fine grained sand, wet		
	15					Boring Terminated at 15 feet bgs		
	20							

Figure

X:\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-16** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **12 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **Not Encountered ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Gravel and Fill		
				SP		Poorly graded sand (Fill), yellowish brown (10YR 5/8) (0,100,0), fine grained sand, moist,	1.2	
	5			CL		Silty clay, very dark grey (2.5YR 3/1) (0,5,95), medium plasticity, moist, stiff,	0	
	10		SB-16-12	CL		Becomes light olive brown (2.5Y 5/6)	31	
						Boring Terminated at 12 feet bgs		
	15							
	20							

Figure

X:\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

Project: Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road
Project Number: 115132

Log of Boring SB-17

Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **16 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **14 feet ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Gravel and Fill		
				SP		Poorly graded sand (Fill), yellowish brown (10YR 5/8) (0,100,0), fine grained sand, moist		
				CL		Silty clay, black (2.5Y 2.5/1) (0,0,100), medium plasticity, moist,	0	
	5							
			SB-17-8	CL		Becomes dark greyish brown (2.5Y 4/2), very stiff, low plasticity, slight hydrocarbon odor		
	10							
			SB-17-12	CL		Sandy clay, dark greyish brown (2.5Y4/2) (0,25,75) low plasticity, fine grained sand, moist, strong hydrocarbon odor		
				SP		Poorly graded sand, dark greyish brown (2.5Y 4/2), (0,100,0), saturated, strong hydrocarbon odor. (ATD) ▽		
	15							
						Boring terminated at 16 feet bgs.		
	20							

Figure

X:\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-18** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **12 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **Not Encountered ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Gravel and Fill		
				SP		Poorly graded sand (Fill), (0,100,0), fine grained sand, moist		
				CL		Silty clay, very dark grey (2.5Y 3/1) (0,5,95), low plasticity, moist, stiff, strong hydrocarbon odor		
	5							
			SB-18-8	CL		hydrocarbon odor		
	10			CL		increased silt, with some fine grained sand (0,20,,80), strong hydrocarbon odor.		
			SB-18-12			Boring terminated at 12 feet bgs.		
	15							
	20							

Figure

X:\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-19** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **15 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **13.5 feet ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Gravel and Fill		
				SP		Poorly graded sand (Fill), dark greyish brown (2.5Y 4/2) (0,100,0), fine grained sand, moist, strong hydrocarbon odor		
				CL		Silty clay, very dark grey (2.5Y 3/1) (0,10,90), medium plasticity, moist, stiff, strong hydrocarbon odor		
	5		SB-19-8					
	10			CL		increased silt with strong hydrocarbon odor		
			SB-19-12					
				SP		Poorly graded sand, very dark grey (2.5Y 3/1) (0,100,0) fine grained sand, wet (ATD) ▽		
	15					Boring terminated at 15 feet bgs.		
	20							

Figure

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Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-20** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **15 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **13.5 feet ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Topsoil		
				CL		Silty clay, dark yellowish brown (10YR 4/4) (0,10,90), medium plasticity, moist, medium stiff, no odor		
	5							
	10		SB-20-11	CL		Some dark grey and black staining, slight hydrocarbon odor		
				CL		increasing hydrocarbon odor		
				SP		Poorly graded sand, dark grey (2.5Y 3/1)(0,100,0) fine grained sand, wet. (ATD) ▽		
	15					Boring terminated at 15 feet bgs.		
	20							

Figure

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Project: Thomas Properties **Project Location: Brentwood Blvd. & Sand Creek Road** **Project Number: 115132**	**Log of Boring SB-21** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.8 inch**	Total Depth of Borehole **16 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured **14 feet ATD**	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Topsoil		
				CL		Silty clay, dark yellowish brown (10YR 4/4) (0,10,90), medium plasticity, moist, no odor		
	5							
			SB-21-8	CL		becomes black (10YR 2/1), medium plasticity, hydrocarbon odor		
				CL		becomes dark greenish grey (10YR 4/1), increased silt, strong hydrocarbon odor		
	10							
				CL		increasing hydrocarbon odor and silt content		
				SP		Poorly graded sand, dark greenish grey (10YR 4/1), fine grained sand, wet, strong hydrocarbon odor (ATD) ▽		
	15							
						Boring terminated at 16 feet bgs.		
	20							

Figure

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Project: Thomas Properties Project Location: Brentwood Blvd. & Sand Creek Road Project Number: 115132	**Log of Boring SB-22** Sheet 1 of 1

Date(s) Drilled **December 12, 2005**	Logged By **Jeremy Smith**	Checked By **Peter McIntyre**
Drilling Method **Direct Push**	Drill Bit Size/Type **1.2 inch**	Total Depth of Borehole **17 feet bgs**
Drill Rig Type **Truck Mounted**	Drilling Contractor **ECA**	Approximate Surface Elevation
Groundwater Level and Date Measured	Sampling Method(s) **None**	Hammer Data
Borehole Backfill **Cement Slurry**	Location	

Elevation, feet	Depth, feet	Sample Type	Sample Number	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	PID Reading, ppm	REMARKS AND OTHER TESTS
	0					Gravel and Fill Material		
						Boring Not Logged		
	5							
	10							
	15							
						Boring terminated at 17 feet bgs, and a groundwter sample was collected.		
	20							

Figure

X:\PROJECTS\CHARACTERIZATION & REMEDIATION\DUE DIL & MISC\12767 PH II (Thomas) Brentwood - PJM\Boring Logs.bgs (Geoprobe boring 20.tpl)

APPENDIX B

LABORATORY ANALYTICAL REPORT WITH CHAIN OF CUSTODY DOCUMENTATION

Pg 1/1

051159 aeL

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

EDF Required? ☐ Yes ☒ No

Report To: Jeremy Smith Bill To: same P.O. #1105-267
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 E-Mail: jasmith@aeiconsultants.com
Tele: (925) 283-6000 Fax: (925) 283-6121
Project #: 12767 Project Name: Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road, Brentwood, CA
Sampler Signature: Adrian Acevedo

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	HVOCs EPA 8260	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	Lead and Arsenic EPA Method 6000 series	Organochlorine Pesticides Method 8080/8081	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other: Please composite sample prior to Analysis			Comments
SS-1		11/7/05		4	L																		X	X						X				PO#1105-267
SS-2		"			I																		X	X						X				
SS-3		"			N																		X	X						X				
SS-4		"		3	E																		X	X						X				
SS-5		"			R																		X	X						X				
SS-6		"																					X	X						X				
SS-7		"																					X	X						X				
SS-8		"																					X	X						X				
SS-9		11/8/05		2																			X	X						X				
SS-10		"		4																			X	X						X				
SS-11		"																					X	X						X				
SS-12		"																					X	X						X				
SS-13		"																					X	X						X				
SS-14		"																					X	X						X				

Relinquished By:	Date:	Time:	Received By:
Adrian Acevedo	11/8/05	12:00	[illegible]

ICE/t° _____
GOOD CONDITION ✓
HEAD SPACE ABSENT _____
DECHLORINATED IN LAB _____

PRESERVATION APPROPRIATE ✓ CONTAINERS
PERSERVED IN LAB _____

	VOAS	O&G	METALS	OTHER
PRESERVATION				

Pg 1/2

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

EDF Required? ☐ Yes ☒ No

Report To: Jeremy Smith Bill To: same P.O. #1105-267
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 E-Mail: jasmith@aeiconsultants.com
Tele: (925) 283-6000 Fax: (925) 283-6121
Project #: 12767 Project Name: Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road, Brentwood, CA
Sampler Signature: Adrian Nieto

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	HVOCs EPA 8260	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	Lead and Arsenic EPA Method 6000 series	Organochlorine Pesticides Method 8080/8081	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other: Please composite sample prior to Analysis	Comments
SS-15		11/8/05		4	L																		X	X						X	PO#1105-267
SS-16		"		"	I																		X	X						X	
SS-17		"		1	N																		X	X						X	
SS-18		"		1	E																		X	X						X	
SS-19		"		1	R																		X	X						X	
~~SS-17~~				0																											
~~SS-18~~				0																											
SS-19				1																											

Relinquished By:	Date:	Time:	Received By:
Adrian Nieto	11/8/05	17:00	[illegible]
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t° _____ PRESERVATION _____ VOAS | O&G | METALS | OTHER
GOOD CONDITION ✓ APPROPRIATE
HEAD SPACE ABSENT _____ CONTAINERS ✓
DECHLORINATED IN LAB _____ PERSERVED IN LAB _____

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0511159 **ClientID: AEL** **EDF: NO**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #12767; Thomas Properties
PO: 1105-267

Bill to:
Diane
All Environmental, Inc.
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 5 days

Date Received: 11/08/2005
Date Printed: 11/08/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0511159-001	SS-1	Soil	11/07/2005	☐	A	A										
0511159-002	SS-2	Soil	11/07/2005	☐	A	A										
0511159-003	SS-3	Soil	11/07/2005	☐	A	A										
0511159-004	SS-4	Soil	11/07/2005	☐	A	A										
0511159-005	SS-5	Soil	11/07/2005	☐	A	A										
0511159-006	SS-6	Soil	11/07/2005	☐	A	A										
0511159-007	SS-7	Soil	11/07/2005	☐	A	A										
0511159-008	SS-8	Soil	11/07/2005	☐	A	A										
0511159-009	SS-9	Soil	11/08/2005	☐	A	A										
0511159-010	SS-10	Soil	11/08/2005	☐	A	A										
0511159-011	SS-11	Soil	11/08/2005	☐	A	A										
0511159-012	SS-12	Soil	11/08/2005	☐	A	A										
0511159-013	SS-13	Soil	11/08/2005	☐	A	A										
0511159-014	SS-14	Soil	11/08/2005	☐	A	A										
0511159-015	SS-15	Soil	11/08/2005	☐	A	A										

Test Legend:

1	8081_S	2	PBASMS_S	3		4		5	
6		7		8		9		10	
11		12							

Prepared by: Juanita Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0511159 **ClientID: AEL** **EDF: NO**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #12767; Thomas Properties
PO: 1105-267

Bill to:
Diane
All Environmental, Inc.
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 5 days
Date Received: 11/08/2005
Date Printed: 11/08/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0511159-016	SS-16	Soil	11/08/2005	☐	A	A										
0511159-017	SS-17	Soil	11/08/2005	☐	A	A										
0511159-018	SS-18	Soil	11/08/2005	☐	A	A										
0511159-019	SS-19	Soil	11/08/2005	☐	A	A										

Test Legend:

1	8081_S	2	PBASMS_S	3		4		5	
6		7		8		9		10	
11		12							

Prepared by: Juanita Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
		Date Received: 11/08/05
	Client Contact: Jeremy Smith	Date Extracted 11/08/05
	Client P.O.: 1105-267	Date Analyzed 11/11/05-11/15/05

Organochlorine Pesticides by GC-ECD (8080 Basic Target List)*

Extraction Method: SW3550C Analytical Method: SW8081B Work Order: 0511159

Lab ID	0511159-001A	0511159-002A	0511159-003A	0511159-004A	Reporting Limit for DF =1	
Client ID	SS-1	SS-2	SS-3	SS-4		
Matrix	S	S	S	S		
DF	1	1	1	1	S	W
Compound	**Concentration**				mg/kg	µg/L
Aldrin	ND	ND	ND	ND	0.001	NA
a-BHC	ND	ND	ND	ND	0.001	NA
b-BHC	ND	ND	ND	ND	0.001	NA
d-BHC	ND	ND	ND	ND	0.001	NA
g-BHC	ND	ND	ND	ND	0.001	NA
Chlordane (Technical)	ND	ND	ND	ND	0.025	NA
a-Chlordane	ND	ND	ND	ND	0.001	NA
g-Chlordane	ND	ND	ND	ND	0.001	NA
p,p-DDD	ND	ND	ND	ND	0.001	NA
p,p-DDE	0.031	0.023	0.017	0.015	0.001	NA
p,p-DDT	0.0048	0.0035	0.0023	0.0022	0.001	NA
Dieldrin	ND	ND	ND	ND	0.001	NA
Endosulfan I	ND	ND	ND	ND	0.001	NA
Endosulfan II	ND	ND	ND	ND	0.001	NA
Endosulfan sulfate	ND	ND	ND	ND	0.001	NA
Endrin	ND	ND	ND	ND	0.001	NA
Endrin aldehyde	ND	ND	ND	ND	0.001	NA
Heptachlor	ND	ND	ND	ND	0.001	NA
Heptachlor epoxide	ND	ND	ND	ND	0.001	NA
Methoxychlor	ND	ND	ND	ND	0.001	NA
Toxaphene	ND	ND	ND	ND	0.05	NA
Surrogate Recoveries (%)						
%SS:	98	101	99	100		
Comments						

* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

(a) PCB aroclor 1016; (b) PCB aroclor 1221; (c) PCB aroclor 1232; (d) PCB aroclor 1242; (e) PCB aroclor 1248; (f) PCB aroclor 1254; (g) PCB aroclor 1260; (h) a lighter than water immiscible sheen/product is present; (i) liquid sample that contains >~1 vol. % sediment; (j) sample diluted due to high organic content; (k) p,p,- is the same as 4,4,-; (l) florisil (EPA 3620) cleanup; (m) silica-gel (EPA 3630) cleanup; (n) elemental sulfur (EPA 3660) cleanup; (o) sulfuric acid permanganate (EPA 3665) cleanup; (r) results are reported on a dry weight basis; (p) see attached narrative.

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AEI Consultants	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
2500 Camino Diablo, Ste. #200		Date Received: 11/08/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted 11/08/05
	Client P.O.: 1105-267	Date Analyzed 11/11/05-11/15/05

Organochlorine Pesticides by GC-ECD (8080 Basic Target List)*

Extraction Method: SW3550C Analytical Method: SW8081B Work Order: 0511159

Lab ID	0511159-005A	0511159-006A	0511159-007A	0511159-008A	Reporting Limit for DF =1	
Client ID	SS-5	SS-6	SS-7	SS-8		
Matrix	S	S	S	S		
DF	1	1	1	1	S	W
Compound	**Concentration**				mg/kg	µg/L
Aldrin	ND	ND	ND	ND	0.001	NA
a-BHC	ND	ND	ND	ND	0.001	NA
b-BHC	ND	ND	ND	ND	0.001	NA
d-BHC	ND	ND	ND	ND	0.001	NA
g-BHC	ND	ND	ND	ND	0.001	NA
Chlordane (Technical)	ND	ND	ND	ND	0.025	NA
a-Chlordane	ND	ND	ND	ND	0.001	NA
g-Chlordane	ND	ND	ND	ND	0.001	NA
p,p-DDD	ND	ND	ND	ND	0.001	NA
p,p-DDE	0.021	0.028	0.031	0.022	0.001	NA
p,p-DDT	0.0028	0.0041	0.0046	0.0039	0.001	NA
Dieldrin	ND	ND	ND	ND	0.001	NA
Endosulfan I	ND	ND	ND	ND	0.001	NA
Endosulfan II	ND	ND	ND	ND	0.001	NA
Endosulfan sulfate	ND	ND	ND	ND	0.001	NA
Endrin	ND	ND	ND	ND	0.001	NA
Endrin aldehyde	ND	ND	ND	ND	0.001	NA
Heptachlor	ND	ND	ND	ND	0.001	NA
Heptachlor epoxide	ND	ND	ND	ND	0.001	NA
Methoxychlor	ND	ND	ND	ND	0.001	NA
Toxaphene	ND	ND	ND	ND	0.05	NA
Surrogate Recoveries (%)						
%SS:	101	101	102	102		
Comments						

* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

(a) PCB aroclor 1016; (b) PCB aroclor 1221; (c) PCB aroclor 1232; (d) PCB aroclor 1242; (e) PCB aroclor 1248; (f) PCB aroclor 1254; (g) PCB aroclor 1260; (h) a lighter than water immiscible sheen/product is present; (i) liquid sample that contains >~1 vol. % sediment; (j) sample diluted due to high organic content; (k) p,p,- is the same as 4,4,-; (l) florisil (EPA 3620) cleanup; (m) silica-gel (EPA 3630) cleanup; (n) elemental sulfur (EPA 3660) cleanup; (o) sulfuric acid permanganate (EPA 3665) cleanup; (r) results are reported on a dry weight basis; (p) see attached narrative.

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AEI Consultants	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
2500 Camino Diablo, Ste. #200		Date Received: 11/08/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted 11/08/05
	Client P.O.: 1105-267	Date Analyzed 11/11/05-11/15/05

Organochlorine Pesticides by GC-ECD (8080 Basic Target List)*

Extraction Method: SW3550C Analytical Method: SW8081B Work Order: 0511159

Lab ID	0511159-009A	0511159-010A	0511159-011A	0511159-012A	Reporting Limit for DF =1	
Client ID	SS-9	SS-10	SS-11	SS-12		
Matrix	S	S	S	S		
DF	1	1	1	1	S	W
Compound	**Concentration**				mg/kg	µg/L
Aldrin	ND	ND	ND	ND	0.001	NA
a-BHC	ND	ND	ND	ND	0.001	NA
b-BHC	ND	ND	ND	ND	0.001	NA
d-BHC	ND	ND	ND	ND	0.001	NA
g-BHC	ND	ND	ND	ND	0.001	NA
Chlordane (Technical)	ND	ND	ND	ND	0.025	NA
a-Chlordane	ND	ND	ND	ND	0.001	NA
g-Chlordane	ND	ND	ND	ND	0.001	NA
p,p-DDD	ND	ND	ND	ND	0.001	NA
p,p-DDE	0.016	0.019	0.016	0.015	0.001	NA
p,p-DDT	0.0023	0.0031	0.0022	0.0027	0.001	NA
Dieldrin	ND	ND	ND	ND	0.001	NA
Endosulfan I	ND	ND	ND	ND	0.001	NA
Endosulfan II	ND	ND	ND	ND	0.001	NA
Endosulfan sulfate	ND	ND	ND	ND	0.001	NA
Endrin	ND	ND	ND	ND	0.001	NA
Endrin aldehyde	ND	ND	ND	ND	0.001	NA
Heptachlor	ND	ND	ND	ND	0.001	NA
Heptachlor epoxide	ND	ND	ND	ND	0.001	NA
Methoxychlor	ND	ND	ND	ND	0.001	NA
Toxaphene	ND	ND	ND	ND	0.05	NA
Surrogate Recoveries (%)						
%SS:	100	114	114	114		
Comments						

* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

(a) PCB aroclor 1016; (b) PCB aroclor 1221; (c) PCB aroclor 1232; (d) PCB aroclor 1242; (e) PCB aroclor 1248; (f) PCB aroclor 1254; (g) PCB aroclor 1260; (h) a lighter than water immiscible sheen/product is present; (i) liquid sample that contains >~1 vol. % sediment; (j) sample diluted due to high organic content; (k) p,p,- is the same as 4,4,-; (l) florisil (EPA 3620) cleanup; (m) silica-gel (EPA 3630) cleanup; (n) elemental sulfur (EPA 3660) cleanup; (o) sulfuric acid permanganate (EPA 3665) cleanup; (r) results are reported on a dry weight basis; (p) see attached narrative.

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AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
		Date Received: 11/08/05
	Client Contact: Jeremy Smith	Date Extracted 11/08/05
	Client P.O.: 1105-267	Date Analyzed 11/11/05-11/15/05

Organochlorine Pesticides by GC-ECD (8080 Basic Target List)*

Extraction Method: SW3550C Analytical Method: SW8081B Work Order: 0511159

Lab ID	0511159-013A	0511159-014A	0511159-015A	0511159-016A	Reporting Limit for DF =1	
Client ID	SS-13	SS-14	SS-15	SS-16		
Matrix	S	S	S	S		
DF	10	10	1	1	S	W
Compound	**Concentration**				mg/kg	µg/L
Aldrin	ND<0.010	ND<0.010	ND	ND	0.001	NA
a-BHC	ND<0.010	ND<0.010	ND	ND	0.001	NA
b-BHC	ND<0.010	ND<0.010	ND	ND	0.001	NA
d-BHC	ND<0.010	ND<0.010	ND	ND	0.001	NA
g-BHC	ND<0.010	ND<0.010	ND	ND	0.001	NA
Chlordane (Technical)	ND<0.25	ND<0.25	ND	ND	0.025	NA
a-Chlordane	ND<0.010	ND<0.010	ND	ND	0.001	NA
g-Chlordane	ND<0.010	ND<0.010	ND	ND	0.001	NA
p,p-DDD	ND<0.010	ND<0.010	ND	ND	0.001	NA
p,p-DDE	0.14	0.087	0.068	0.056	0.001	NA
p,p-DDT	0.043	0.024	0.032	0.016	0.001	NA
Dieldrin	ND<0.010	ND<0.010	ND	ND	0.001	NA
Endosulfan I	ND<0.010	ND<0.010	ND	ND	0.001	NA
Endosulfan II	ND<0.010	ND<0.010	ND	ND	0.001	NA
Endosulfan sulfate	ND<0.010	ND<0.010	ND	ND	0.001	NA
Endrin	ND<0.010	ND<0.010	ND	ND	0.001	NA
Endrin aldehyde	ND<0.010	ND<0.010	ND	ND	0.001	NA
Heptachlor	ND<0.010	ND<0.010	ND	ND	0.001	NA
Heptachlor epoxide	ND<0.010	ND<0.010	ND	ND	0.001	NA
Methoxychlor	ND<0.010	ND<0.010	ND	ND	0.001	NA
Toxaphene	ND<0.50	ND<0.50	0.22	0.19	0.05	NA
Surrogate Recoveries (%)						
%SS:	106	91	115	115		
Comments						

* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

(a) PCB aroclor 1016; (b) PCB aroclor 1221; (c) PCB aroclor 1232; (d) PCB aroclor 1242; (e) PCB aroclor 1248; (f) PCB aroclor 1254; (g) PCB aroclor 1260; (h) a lighter than water immiscible sheen/product is present; (i) liquid sample that contains >~1 vol. % sediment; (j) sample diluted due to high organic content; (k) p,p,- is the same as 4,4,-; (l) florisil (EPA 3620) cleanup; (m) silica-gel (EPA 3630) cleanup; (n) elemental sulfur (EPA 3660) cleanup; (o) sulfuric acid permanganate (EPA 3665) cleanup; (r) results are reported on a dry weight basis; (p) see attached narrative.

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AEI Consultants	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
2500 Camino Diablo, Ste. #200		Date Received: 11/08/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted 11/08/05
	Client P.O.: 1105-267	Date Analyzed 11/11/05-11/15/05

Organochlorine Pesticides by GC-ECD (8080 Basic Target List)*

Extraction Method: SW3550C Analytical Method: SW8081B Work Order: 0511159

Lab ID	0511159-017A	0511159-018A	0511159-019A		Reporting Limit for DF =1	
Client ID	SS-17	SS-18	SS-19			
Matrix	S	S	S			
DF	10	20	20		S	W
Compound	**Concentration**				mg/kg	µg/L
Aldrin	ND<0.010	ND<0.020	ND<0.020		0.001	NA
a-BHC	ND<0.010	ND<0.020	ND<0.020		0.001	NA
b-BHC	ND<0.010	ND<0.020	ND<0.020		0.001	NA
d-BHC	ND<0.010	ND<0.020	ND<0.020		0.001	NA
g-BHC	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Chlordane (Technical)	ND<0.25	ND<0.50	ND<0.50		0.025	NA
a-Chlordane	0.020	ND<0.020	ND<0.020		0.001	NA
g-Chlordane	0.011	ND<0.020	ND<0.020		0.001	NA
p,p-DDD	ND<0.010	ND<0.020	ND<0.020		0.001	NA
p,p-DDE	0.023	ND<0.020	ND<0.020		0.001	NA
p,p-DDT	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Dieldrin	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Endosulfan I	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Endosulfan II	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Endosulfan sulfate	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Endrin	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Endrin aldehyde	ND<0.010	ND<0.02	ND<0.020		0.001	NA
Heptachlor	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Heptachlor epoxide	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Methoxychlor	ND<0.010	ND<0.020	ND<0.020		0.001	NA
Toxaphene	ND<0.50	ND<1.0	ND<1.0		0.05	NA
Surrogate Recoveries (%)						
%SS:	92	99	96			
Comments		j	j			

* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

(a) PCB aroclor 1016; (b) PCB aroclor 1221; (c) PCB aroclor 1232; (d) PCB aroclor 1242; (e) PCB aroclor 1248; (f) PCB aroclor 1254; (g) PCB aroclor 1260; (h) a lighter than water immiscible sheen/product is present; (i) liquid sample that contains >~1 vol. % sediment; (j) sample diluted due to high organic content; (k) p,p,- is the same as 4,4,-; (l) florisil (EPA 3620) cleanup; (m) silica-gel (EPA 3630) cleanup; (n) elemental sulfur (EPA 3660) cleanup; (o) sulfuric acid permanganate (EPA 3665) cleanup; (r) results are reported on a dry weight basis; (p) see attached narrative.

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AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
		Date Received: 11/08/05
	Client Contact: Jeremy Smith	Date Extracted: 11/08/05
	Client P.O.: 1105-267	Date Analyzed: 11/09/05

Arsenic and Lead*

Extraction method: SW3050B Analytical methods: 6020A Work Order: 0511159

Lab ID	Client ID	Matrix	Extraction	Arsenic	Lead	DF	% SS
001A	SS-1	S	TTLC	17	47	1	83
002A	SS-2	S	TTLC	16	38	1	97
003A	SS-3	S	TTLC	15	29	1	88
004A	SS-4	S	TTLC	15	33	1	103
005A	SS-5	S	TTLC	15	34	1	107
006A	SS-6	S	TTLC	17	39	1	100
007A	SS-7	S	TTLC	16	40	1	101
008A	SS-8	S	TTLC	15	32	1	97
009A	SS-9	S	TTLC	15	33	1	108
010A	SS-10	S	TTLC	14	28	1	101
011A	SS-11	S	TTLC	15	30	1	94
012A	SS-12	S	TTLC	13	25	1	100
013A	SS-13	S	TTLC	15	22	1	110
014A	SS-14	S	TTLC	15	22	1	108
015A	SS-15	S	TTLC	14	18	1	106
016A	SS-16	S	TTLC	15	19	1	110

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	TTLC	NA	NA	NA
	S	TTLC	0.5	0.5	mg/Kg

*water samples are reported in µg/L, product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

**Soil final results are based on 17% water content relative to Soil initial.

means surrogate diluted out of range; ND means not detected above the reporting limit; N/A means not applicable to this sample or instrument.

i) aqueous sample containing greater than ~1 vol. % sediment; for DISSOLVED metals, this sample has been preserved prior to filtration; for TTLC metals, a representative sediment-water mixture was digested; j) reporting limit raised due to insufficient sample amount; k) reporting limit raised due to matrix interference; m) estimated value due to low/high surrogate recovery, caused by matrix interference; n) results are reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644 _____Angela Rydelius, Lab Manager

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AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #12767; Thomas Properties	Date Sampled: 11/07/05-11/08/05
		Date Received: 11/08/05
	Client Contact: Jeremy Smith	Date Extracted: 11/08/05
	Client P.O.: 1105-267	Date Analyzed: 11/09/05

Arsenic and Lead*

Extraction method: SW3050B Analytical methods: 6020A Work Order: 0511159

Lab ID	Client ID	Matrix	Extraction	Arsenic	Lead	DF	% SS
017A	SS-17	S	TTLC	19	110	1	112
018A	SS-18	S	TTLC	14	77	1	110
019A	SS-19	S	TTLC	14	110	1	108

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	TTLC	NA	NA	NA
	S	TTLC	0.5	0.5	mg/Kg

*water samples are reported in µg/L, product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

**Soil final results are based on 17% water content relative to Soil initial.

means surrogate diluted out of range; ND means not detected above the reporting limit; N/A means not applicable to this sample or instrument.

i) aqueous sample containing greater than ~1 vol. % sediment; for DISSOLVED metals, this sample has been preserved prior to filtration; for TTLC metals, a representative sediment-water mixture was digested; j) reporting limit raised due to insufficient sample amount; k) reporting limit raised due to matrix interference; m) estimated value due to low/high surrogate recovery, caused by matrix interference; n) results are reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644 _____Angela Rydelius, Lab Manager

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QC SUMMARY REPORT FOR SW8081B

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511159

EPA Method: SW8081B **Extraction: SW3550C** **BatchID: 18899** **Spiked Sample ID: 0511081-002A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
Aldrin	ND	0.010	119	117	1.44	118	118	0	70 - 130	70 - 130
g-BHC	ND	0.010	96.3	96.5	0.162	91.9	91.9	0	70 - 130	70 - 130
p,p-DDT	ND	0.025	102	103	0.831	93.3	91.8	1.70	70 - 130	70 - 130
Dieldrin	ND	0.025	102	102	0	98.1	97.7	0.413	70 - 130	70 - 130
Endrin	ND	0.025	95.9	96.7	0.750	91.5	91.7	0.251	70 - 130	70 - 130
Heptachlor	ND	0.010	100	101	0.384	95.4	95.2	0.242	70 - 130	70 - 130
%SS:	105	0.050	93	92	1.05	94	94	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 18899 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511159-001A	11/07/05	11/08/05	11/11/05 3:22 AM	0511159-002A	11/07/05	11/08/05	11/11/05 4:16 AM
0511159-003A	11/07/05	11/08/05	11/11/05 5:10 AM	0511159-004A	11/07/05	11/08/05	11/11/05 6:04 AM
0511159-005A	11/07/05	11/08/05	11/11/05 6:59 AM	0511159-006A	11/07/05	11/08/05	11/11/05 7:54 AM
0511159-007A	11/07/05	11/08/05	11/11/05 8:48 AM	0511159-008A	11/07/05	11/08/05	11/11/05 9:43 AM
0511159-009A	11/08/05	11/08/05	11/12/05 2:16 AM	0511159-010A	11/08/05	11/08/05	1/11/05 12:11 PM
0511159-011A	11/08/05	11/08/05	1/11/05 11:15 AM	0511159-012A	11/08/05	11/08/05	1/11/05 10:20 AM
0511159-013A	11/08/05	11/08/05	11/15/05 3:02 PM	0511159-014A	11/08/05	11/08/05	11/15/05 3:04 PM
0511159-015A	11/08/05	11/08/05	11/11/05 7:33 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR SW8081B

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511159

EPA Method: SW8081B **Extraction: SW3550C** **BatchID: 18935** **Spiked Sample ID: 0511159-016A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
Aldrin	ND	0.010	113	112	0.134	107	107	0	70 - 130	70 - 130
g-BHC	ND	0.010	99.5	100	0.587	95.2	94.7	0.460	70 - 130	70 - 130
p,p-DDT	0.016	0.025	114	116	0.970	95.6	95.4	0.165	70 - 130	70 - 130
Dieldrin	ND	0.025	118	119	0.455	107	106	0.273	70 - 130	70 - 130
Endrin	ND	0.025	113	113	0	96.9	97.4	0.482	70 - 130	70 - 130
Heptachlor	ND	0.010	104	105	0.777	99.8	99.4	0.357	70 - 130	70 - 130
%SS:	115	0.050	116	115	1.20	98	111	12.1	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 18935 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511159-016A	11/08/05	11/08/05	11/11/05 6:37 AM	0511159-017A	11/08/05	11/08/05	11/12/05 3:10 AM
0511159-018A	11/08/05	11/08/05	11/12/05 4:04 AM	0511159-019A	11/08/05	11/08/05	11/12/05 4:58 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR 6020A

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511159

EPA Method: 6020A **Extraction: SW3050B** **BatchID: 18904** **Spiked Sample ID: 0511108-001A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	Spiked	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	mg/Kg	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
Arsenic	4.2	50	116	108	6.47	10	98.4	92.2	6.51	75 - 125	80 - 120
Lead	16	50	109	101	5.72	10	95.2	90.4	5.17	75 - 125	80 - 120
%SS:	91	250	97	94	2.96	250	95	95	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 18904 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511159-001A	11/07/05	11/08/05	11/09/05 2:35 AM	0511159-002A	11/07/05	11/08/05	11/09/05 2:42 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR 6020A

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511159

EPA Method: 6020A **Extraction: SW3050B** **BatchID: 18938** **Spiked Sample ID: 0511159-003A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	Spiked	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	mg/Kg	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
Arsenic	15	50	113	99	10.0	10	90.1	95.2	5.50	75 - 125	80 - 120
Lead	29	50	105	104	0.921	10	86.9	92.3	6.03	75 - 125	80 - 120
%SS:	88	250	97	100	3.01	250	97	102	4.91	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 18938 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511159-003A	11/07/05	11/08/05	11/09/05 1:09 AM	0511159-004A	11/07/05	11/08/05	11/09/05 2:50 AM
0511159-005A	11/07/05	11/08/05	11/09/05 2:57 AM	0511159-006A	11/07/05	11/08/05	11/09/05 3:05 AM
0511159-007A	11/07/05	11/08/05	11/09/05 3:13 AM	0511159-008A	11/07/05	11/08/05	11/09/05 3:20 AM
0511159-009A	11/08/05	11/08/05	11/09/05 3:28 AM	0511159-010A	11/08/05	11/08/05	11/09/05 3:36 AM
0511159-011A	11/08/05	11/08/05	11/09/05 4:35 AM	0511159-012A	11/08/05	11/08/05	11/09/05 4:42 AM
0511159-013A	11/08/05	11/08/05	11/09/05 4:50 AM	0511159-014A	11/08/05	11/08/05	11/09/05 4:58 AM
0511159-015A	11/08/05	11/08/05	11/09/05 5:05 AM	0511159-016A	11/08/05	11/08/05	11/09/05 5:13 AM
0511159-017A	11/08/05	11/08/05	11/09/05 5:20 AM	0511159-017A	11/08/05	11/08/05	11/09/05 1:17 PM
0511159-018A	11/08/05	11/08/05	11/09/05 5:36 AM	0511159-019A	11/08/05	11/08/05	11/09/05 5:43 AM
0511159-019A	11/08/05	11/08/05	11/09/05 1:23 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

0511271 aeL

McCAMPBELL ANALYTICAL INC.

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PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☑ 5 DAY

EDF Required? ☐ Yes ☑ No

Report To: Jeremy Smith Bill To: same P.O. #100024
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 E-Mail: jasmith@aeiconsultants.com
Tele: (925) 283-6000 Fax: (925) 283-6121
Project #: 115132 Project Name: Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road
Sampler Signature:

	SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	TPH Multi-Range (8015)	Total Petroleum Hydrocarbons (418.1)	SVOCs 8270	Organochlorine Pesticides 8080/8081	Herbicides EPA Method 8051	VOCs 8260	EPA 624 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Composite Prior to Analysis	Comments
+50	SB-1		11/14/05	1030	5	VOA	X						X			X	X															P.O# 100024
+50	SB-2			1155	5		X						X			X	X															
+1	SB-3			1435	5		X						X			X	X															
+50	SB-4			1430	5		X						X			X	X															
	~~[illegible]~~	SB-1-16		~~[illegible]~~ 1120	1	Liter		X				X				X	X															
	SB-2-16			1105	1			X				X				X	X															
	SB-3-16			1240	1			X				X				X	X															
	SB-4-16			1405	1			X				X				X	X															

Relinquished By:	Date:	Time:	Received By:
	11/14/05	1615	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t° _____ GOOD CONDITION ✓ HEAD SPACE ABSENT _____ DECHLORINATED IN LAB _____

PRESERVATION APPROPRIATE ✓ CONTAINERS _____ PERSERVED IN LAB _____

VOAS	O&G	METALS	OTHER

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0511271 **ClientID: AEL** **EDF: NO**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #115132; Thomas Properties
PO: 100024

Bill to:
Diane
All Environmental, Inc.
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 5 days
Date Received: 11/14/2005
Date Printed: 11/14/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0511271-001	SB-1	Water	11/14/05 10:30:00	☐		A		B								
0511271-002	SB-2	Water	11/14/05 11:55:00	☐		A		B								
0511271-003	SB-3	Water	11/14/05 2:35:00	☐		A		B								
0511271-004	SB-4	Water	11/14/05 2:30:00	☐		A		B								
0511271-005	SB-1-16	Soil	11/14/05	☐	A		A									
0511271-006	SB-2-16	Soil	11/14/05 11:05:00	☐	A		A									
0511271-007	SB-3-16	Soil	11/14/05 12:40:00	☐	A		A									
0511271-008	SB-4-16	Soil	11/14/05 2:05:00	☐	A		A									

Test Legend:

1	G-MBTEX_S	2	G-MBTEX_W	3	TPH(D)_S	4	TPH(D)_W	5	
6		7		8		9		10	
11		12							

Prepared by: Juanita Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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AEI Consultants	Client Project ID: #115132; Thomas Properties	Date Sampled: 11/14/05
2500 Camino Diablo, Ste. #200		Date Received: 11/14/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted: 11/14/05-11/15/05
	Client P.O.: 100024	Date Analyzed: 11/15/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0511271

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	SB-1	W	ND,i	ND	ND	ND	ND	ND	1	103
002A	SB-2	W	ND,i	ND	ND	ND	ND	ND	1	106
003A	SB-3	W	ND,i	ND	ND	ND	ND	ND	1	105
004A	SB-4	W	ND,i	ND	ND	ND	ND	ND	1	103
005A	SB-1-16	S	ND	ND	ND	ND	ND	ND	1	100
006A	SB-2-16	S	ND	ND	ND	ND	ND	ND	1	99
007A	SB-3-16	S	ND	ND	ND	ND	ND	ND	1	96
008A	SB-4-16	S	ND	ND	ND	ND	ND	ND	1	97

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

_____Angela Rydelius, Lab Manager

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AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #115132; Thomas Properties	Date Sampled: 11/14/05
		Date Received: 11/14/05
	Client Contact: Jeremy Smith	Date Extracted: 11/14/05
	Client P.O.: 100024	Date Analyzed: 11/14/05-11/15/05

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method: SW3510C/SW3550C Analytical methods: SW8015C Work Order: 0511271

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0511271-001B	SB-1	W	ND,i	1	90
0511271-002B	SB-2	W	ND,i	1	90
0511271-003B	SB-3	W	ND,i	1	94
0511271-004B	SB-4	W	ND,i	1	91
0511271-005A	SB-1-16	S	ND	1	103
0511271-006A	SB-2-16	S	ND	1	104
0511271-007A	SB-3-16	S	ND	1	104
0511271-008A	SB-4-16	S	ND	1	103

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	1.0	mg/Kg

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel is significant; d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

DHS Certification No. 1644 _____Angela Rydelius, Lab Manager

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511271

EPA Method: SW8015C **Extraction: SW3550C** **BatchID: 19004** **Spiked Sample ID: 0511270-001A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	20	106	105	0.648	105	105	0	70 - 130	70 - 130
%SS:	110	50	98.5	99.8	1.33	102	102	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19004 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511271-005A	11/14/05	11/14/05	1/14/05 10:51 PM	0511271-006A	1/14/05 11:05 AM	11/14/05	11/15/05

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511271

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 19011 Spiked Sample ID: 0511246-008A

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex) £	ND	0.60	106	118	10.2	104	107	2.83	70 - 130	70 - 130
MTBE	ND	0.10	91.6	94.4	2.98	112	93.9	17.3	70 - 130	70 - 130
Benzene	ND	0.10	86.1	84.9	1.30	97.4	95.3	2.16	70 - 130	70 - 130
Toluene	ND	0.10	87.5	88.6	1.24	85.1	83.6	1.69	70 - 130	70 - 130
Ethylbenzene	ND	0.10	91.6	95	3.67	107	106	0.485	70 - 130	70 - 130
Xylenes	ND	0.30	94.3	100	5.83	96.3	96.3	0	70 - 130	70 - 130
%SS:	90	0.10	94	97	2.88	109	106	2.82	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19011 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511271-005A	11/14/05	11/14/05	1/15/05 12:03 AM	0511271-006A	1/14/05 11:05 AM	11/14/05	1/15/05 12:36 AM
0511271-007A	1/14/05 12:40 PM	11/14/05	11/15/05 1:09 AM	0511271-008A	11/14/05 2:05 PM	11/14/05	11/15/05 1:42 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0511271

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 19016 Spiked Sample ID: 0511271-001A

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex) £	ND	60	105	104	1.15	101	104	2.89	70 - 130	70 - 130
MTBE	ND	10	94.3	92.1	2.37	89.1	99.2	10.8	70 - 130	70 - 130
Benzene	ND	10	91.6	93.2	1.73	91.2	94.5	3.54	70 - 130	70 - 130
Toluene	ND	10	91.7	93.7	2.15	92.2	94	1.94	70 - 130	70 - 130
Ethylbenzene	ND	10	99.6	101	1.53	102	102	0	70 - 130	70 - 130
Xylenes	ND	30	91.7	90.7	1.10	91.7	91.7	0	70 - 130	70 - 130
%SS:	103	10	98	100	2.26	100	102	2.01	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19016 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511271-001A	1/14/05 10:30 AM	11/15/05	11/15/05 2:51 AM	0511271-002A	1/14/05 11:55 AM	11/15/05	11/15/05 3:21 AM
0511271-003A	11/14/05 2:35 PM	11/15/05	11/15/05 4:20 AM	0511271-004A	11/14/05 2:30 PM	11/15/05	11/15/05 4:50 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not applicable or not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____QA/QC Officer

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0511271

EPA Method: SW8015C **Extraction: SW3510C** **BatchID: 19018** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	N/A	1000	N/A	N/A	N/A	106	98.5	7.52	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	106	100	6.45	N/A	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19018 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511271-001B	1/14/05 10:30 AM	11/14/05	11/15/05 3:40 AM	0511271-002B	1/14/05 11:55 AM	11/14/05	11/15/05
0511271-003B	11/14/05 2:35 PM	11/14/05	11/15/05 1:22 AM	0511271-004B	11/14/05 2:30 PM	11/14/05	11/15/05 2:31 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511271

EPA Method: SW8015C **Extraction: SW3550C** **BatchID: 19020** **Spiked Sample ID: 0511271-008A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	20	105	103	1.79	103	103	0	70 - 130	70 - 130
%SS:	103	50	103	102	0.511	106	105	0.795	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19020 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511271-007A	11/14/05 12:40 PM	11/14/05	11/15/05 1:22 AM	0511271-008A	11/14/05 2:05 PM	11/14/05	11/15/05 2:31 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

051310

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

EDF Required? ☒ Yes ☐ No

Report To: Jeremy Smith Bill To: same P.O. #100024
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 E-Mail: jasmith@aeiconsultants.com
Tele: (925) 283-6000 Fax: (925) 283-6121
Project #: 115132 Project Name: Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road
Sampler Signature: Adrian Nero

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	TPH Multi-Range (8015)	Total Petroleum Hydrocarbons (418.1)	SVOCs 8270	Organochlorine Pesticides 8080/8081	Herbicides EPA Method 8051	VOCs 8260	EPA 624 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Composite Prior to Analysis	Other	Other	Other	Other	Comments
SB-5-25'		11/15/05	12:00	1	B		X				X				X	X	X														X				P.O# 100024
SB-6-6"			12:15	1	R		X										X																		
SB-8-8"			10:45	1	A												X																		
Comp-1			12:40	4	S															X	X									X					
SB-9-10"			11:05	1	S												X																		
SB-10-12"			11:20	1													X																		
SB-11-12"			11:45	1													X																		
SB-7-12"			1:10	1													X					X													
SB-12-10"			11:35	1													X																		
SB-13-6"			13:40	1													X																		

Relinquished By:	Date:	Time:	Received By:
Adrian Nero	11/16/05	9:30	[illegible]
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t° ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT
DECHLORINATED IN LAB
PRESERVATION APPROPRIATE ✓
CONTAINERS ✓
PERSERVED IN LAB

VOAS	O&G	METALS	OTHER

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0511310 **ClientID: AEL** **EDF: YES**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #115132
PO: #100024

Bill to:
Diane
All Environmental, Inc.
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 5 days

Date Received: 11/16/2005
Date Printed: 11/16/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0511310-001	SB-5-2.5"	Soil	11/15/05 12:00:00	☐				A	A							
0511310-002	SB-6-6"	Soil	11/15/05 12:15:00	☐				A								
0511310-003	SB-8-8"	Soil	11/15/05 10:45:00	☐				A								
0511310-004	Comp 1-4	Soil	11/15/05 12:40:00	☐	A	A										
0511310-005	SB-9-10"	Soil	11/15/05 11:05:00	☐				A								
0511310-006	SB-10-12"	Soil	11/15/05 11:20:00	☐				A								
0511310-007	SB-11-12"	Soil	11/15/05 11:45:00	☐				A								
0511310-008	SB-7-12"	Soil	11/15/05 1:10:00	☐			A	A								
0511310-009	SB-12-10"	Soil	11/15/05 11:35:00	☐				A								
0511310-010	SB-13-6"	Soil	11/15/05 1:40:00	☐				A								

Test Legend:

1	8081_S	2	8151A_S	3	8260B_S	4	G-MBTEX_S	5	PREDF REPORT
6		7		8		9		10	
11		12							

Prepared by: Maria Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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AEI Consultants	Client Project ID: #115132	Date Sampled: 11/15/05
		Date Received: 11/16/05
2500 Camino Diablo, Ste. #200	Client Contact: Jeremy Smith	Date Extracted 11/16/05
Walnut Creek, CA 94597	Client P.O.: #100024	Date Analyzed 11/17/05

Organochlorine Pesticides by GC-ECD (8080 Basic Target List)*

Extraction Method: SW3550C Analytical Method: SW8081B Work Order: 0511310

Lab ID	0511310-004A				Reporting Limit for DF =1	
Client ID	Comp 1-4					
Matrix	S				S	W
DF	1					
Compound	**Concentration**				mg/kg	µg/L
Aldrin	ND				0.001	NA
a-BHC	ND				0.001	NA
b-BHC	ND				0.001	NA
d-BHC	ND				0.001	NA
g-BHC	ND				0.001	NA
Chlordane (Technical)	ND				0.025	NA
a-Chlordane	ND				0.001	NA
g-Chlordane	ND				0.001	NA
p,p-DDD	ND				0.001	NA
p,p-DDE	ND				0.001	NA
p,p-DDT	ND				0.001	NA
Dieldrin	ND				0.001	NA
Endosulfan I	ND				0.001	NA
Endosulfan II	ND				0.001	NA
Endosulfan sulfate	ND				0.001	NA
Endrin	ND				0.001	NA
Endrin aldehyde	ND				0.001	NA
Heptachlor	ND				0.001	NA
Heptachlor epoxide	ND				0.001	NA
Methoxychlor	ND				0.001	NA
Toxaphene	ND				0.05	NA
Surrogate Recoveries (%)						
%SS:	103					
Comments						

* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

(a) PCB aroclor 1016; (b) PCB aroclor 1221; (c) PCB aroclor 1232; (d) PCB aroclor 1242; (e) PCB aroclor 1248; (f) PCB aroclor 1254; (g) PCB aroclor 1260; (h) a lighter than water immiscible sheen/product is present; (i) liquid sample that contains >~1 vol. % sediment; (j) sample diluted due to high organic content; (k) p,p,- is the same as 4,4,-; (l) florisil (EPA 3620) cleanup; (m) silica-gel (EPA 3630) cleanup; (n) elemental sulfur (EPA 3660) cleanup; (o) sulfuric acid permanganate (EPA 3665) cleanup; (r) results are reported on a dry weight basis; (p) see attached narrative.

McCampbell Analytical, Inc.

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AEI Consultants	Client Project ID: #115132	Date Sampled: 11/15/05
2500 Camino Diablo, Ste. #200		Date Received: 11/16/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted: 11/16/05
	Client P.O.: #100024	Date Analyzed: 11/19/05

Chlorinated Herbicides by GC-ECD (Basic Target List)*

Extraction Method: SW3550C Analytical Method: SW8151A Work Order: 0511310

Lab ID	0511310-004A				Reporting Limit for DF =1	
Client ID	Comp 1-4					
Matrix	S				S	W
DF	1					
Compound	**Concentration**				mg/kg	µg/L
Acifluorfen	ND				0.05	NA
Bentazon	ND				0.05	NA
Chloramben	ND				0.05	NA
2,4-D (Dichlorophenoxyacetic acid)	ND				0.05	NA
2,4-DB	ND				0.05	NA
Dalapon	ND				0.05	NA
DCPA (mono & diacid)	ND				0.05	NA
Dicamba	ND				0.05	NA
3,5-Dichlorobenzoic Acid	ND				0.05	NA
Dichloroprop	ND				0.05	NA
Dinoseb (DNBP)	ND				0.05	NA
MCPA	ND				5.0	NA
MCPP	ND				5.0	NA
4-Nitrophenol	ND				0.05	NA
Pentachlorophenol (PCP)	ND				0.05	NA
Picloram	ND				0.05	NA
2,4,5-T (Trichlorophenoxy acetic acid)	ND				0.05	NA
2,4,5-TP (Silvex)	ND				0.05	NA
Surrogate Recoveries (%)						
%SS:	89					
Comments						

* water samples are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) a lighter than water immiscible sheen/product is present; i) liquid sample that contains >~1 vol. % sediment; j) sample diluted due to high organic content/matrix interference/cluttered chromatogram; k) results reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644 _____Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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AEI Consultants	Client Project ID: #115132	Date Sampled: 11/15/05
		Date Received: 11/16/05
2500 Camino Diablo, Ste. #200	Client Contact: Jeremy Smith	Date Extracted: 11/16/05
Walnut Creek, CA 94597	Client P.O.: #100024	Date Analyzed: 11/16/05

Volatile Organics by P&T and GC/MS (Basic Target List)*

Extraction Method: SW5030B Analytical Method: SW8260B Work Order: 0511310

Lab ID	0511310-008A
Client ID	SB-7-12"
Matrix	Soil

Compound	Concentration *	DF	Reporting Limit	Compound	Concentration *	DF	Reporting Limit
Acetone	ND	1.0	0.05	Acrolein (Propenal)	ND	1.0	0.05
Acrylonitrile	ND	1.0	0.02	tert-Amyl methyl ether (TAME)	ND	1.0	0.005
Benzene	ND	1.0	0.005	Bromobenzene	ND	1.0	0.005
Bromochloromethane	ND	1.0	0.005	Bromodichloromethane	ND	1.0	0.005
Bromoform	ND	1.0	0.005	Bromomethane	ND	1.0	0.005
2-Butanone (MEK)	ND	1.0	0.02	t-Butyl alcohol (TBA)	ND	1.0	0.05
n-Butyl benzene	ND	1.0	0.005	sec-Butyl benzene	ND	1.0	0.005
tert-Butyl benzene	ND	1.0	0.005	Carbon Disulfide	ND	1.0	0.005
Carbon Tetrachloride	ND	1.0	0.005	Chlorobenzene	ND	1.0	0.005
Chloroethane	ND	1.0	0.005	2-Chloroethyl Vinyl Ether	ND	1.0	0.01
Chloroform	ND	1.0	0.005	Chloromethane	ND	1.0	0.005
2-Chlorotoluene	ND	1.0	0.005	4-Chlorotoluene	ND	1.0	0.005
Dibromochloromethane	ND	1.0	0.005	1,2-Dibromo-3-chloropropane	ND	1.0	0.005
1,2-Dibromoethane (EDB)	ND	1.0	0.005	Dibromomethane	ND	1.0	0.005
1,2-Dichlorobenzene	ND	1.0	0.005	1,3-Dichlorobenzene	ND	1.0	0.005
1,4-Dichlorobenzene	ND	1.0	0.005	Dichlorodifluoromethane	ND	1.0	0.005
1,1-Dichloroethane	ND	1.0	0.005	1,2-Dichloroethane (1,2-DCA)	ND	1.0	0.005
1,1-Dichloroethene	ND	1.0	0.005	cis-1,2-Dichloroethene	ND	1.0	0.005
trans-1,2-Dichloroethene	ND	1.0	0.005	1,2-Dichloropropane	ND	1.0	0.005
1,3-Dichloropropane	ND	1.0	0.005	2,2-Dichloropropane	ND	1.0	0.005
1,1-Dichloropropene	ND	1.0	0.005	cis-1,3-Dichloropropene	ND	1.0	0.005
trans-1,3-Dichloropropene	ND	1.0	0.005	Diisopropyl ether (DIPE)	ND	1.0	0.005
Ethylbenzene	ND	1.0	0.005	Ethyl tert-butyl ether (ETBE)	ND	1.0	0.005
Freon 113	ND	1.0	0.1	Hexachlorobutadiene	ND	1.0	0.005
Hexachloroethane	ND	1.0	0.005	2-Hexanone	ND	1.0	0.005
Isopropylbenzene	ND	1.0	0.005	4-Isopropyl toluene	ND	1.0	0.005
Methyl-t-butyl ether (MTBE)	ND	1.0	0.005	Methylene chloride	ND	1.0	0.005
4-Methyl-2-pentanone (MIBK)	ND	1.0	0.005	Naphthalene	ND	1.0	0.005
Nitrobenzene	ND	1.0	0.1	n-Propyl benzene	ND	1.0	0.005
Styrene	ND	1.0	0.005	1,1,1,2-Tetrachloroethane	ND	1.0	0.005
1,1,2,2-Tetrachloroethane	ND	1.0	0.005	Tetrachloroethene	ND	1.0	0.005
Toluene	ND	1.0	0.005	1,2,3-Trichlorobenzene	ND	1.0	0.005
1,2,4-Trichlorobenzene	ND	1.0	0.005	1,1,1-Trichloroethane	ND	1.0	0.005
1,1,2-Trichloroethane	ND	1.0	0.005	Trichloroethene	ND	1.0	0.005
Trichlorofluoromethane	ND	1.0	0.005	1,2,3-Trichloropropane	ND	1.0	0.005
1,2,4-Trimethylbenzene	ND	1.0	0.005	1,3,5-Trimethylbenzene	ND	1.0	0.005
Vinyl Chloride	ND	1.0	0.005	Xylenes	ND	1.0	0.005

Surrogate Recoveries (%)

%SS1:	98	%SS2:	103
%SS3:	104		

Comments:

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L, wipe samples in µg/wipe.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to high organic content/matrix interference; k) reporting limit near, but not identical to our standard reporting limit due to variable Encore sample weight; m) reporting limit raised due to insufficient sample amount; n) results are reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644 _____ Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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AEI Consultants	Client Project ID: #115132	Date Sampled: 11/15/05
2500 Camino Diablo, Ste. #200		Date Received: 11/16/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted: 11/16/05
	Client P.O.: #100024	Date Analyzed: 11/16/05-11/18/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*

Extraction method: SW5030B Analytical methods: SW8015Cm Work Order: 0511310

Lab ID	Client ID	Matrix	TPH(g)	DF	% SS
001A	SB-5-2.5"	S	4.2,g	1	100
002A	SB-6-6"	S	ND	1	94
003A	SB-8-8"	S	ND	1	103
005A	SB-9-10"	S	5100,b,m	500	97
006A	SB-10-12"	S	11,000,b,m	500	118
007A	SB-11-12"	S	2800,b,m	500	94
008A	SB-7-12"	S	ND	1	103
009A	SB-12-10"	S	72,g,m	3.3	84
010A	SB-13-6"	S	ND	1	92

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	NA	NA
	S	1.0	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644 _____Angela Rydelius, Lab Manager

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AEI Consultants	Client Project ID: #115132	Date Sampled: 11/15/05
2500 Camino Diablo, Ste. #200		Date Received: 11/16/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted: 11/16/05
	Client P.O.: #100024	Date Analyzed: 11/17/05-11/19/05

Diesel (C10-23) and Oil (C18+) Range Extractable Hydrocarbons as Diesel and Motor Oil*

Extraction method: SW3550C Analytical methods: SW8015C Work Order: 0511310

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	DF	% SS
0511310-001A	SB-5-2.5"	S	2.6,g,b	7.4	1	91
0511310-002A	SB-6-6"	S	ND	ND	1	110
0511310-003A	SB-8-8"	S	ND	ND	1	110
0511310-005A	SB-9-10"	S	2200,k	ND<250	50	109
0511310-006A	SB-10-12"	S	3100,k	ND<250	50	108
0511310-007A	SB-11-12"	S	990,k	ND<100	20	115
0511310-008A	SB-7-12"	S	ND	ND	1	109
0511310-009A	SB-12-10"	S	400,a,g	47	1	105
0511310-010A	SB-13-6"	S	1.0,g	5.6	1	101

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	NA	NA	ug/L
	S	1.0	5.0	mg/Kg

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel (asphalt?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

DHS Certification No. 1644 _____Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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QC SUMMARY REPORT FOR SW8081B

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511310

EPA Method: SW8081B **Extraction: SW3550C** **BatchID: 19000** **Spiked Sample ID: 0511310-004A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
Aldrin	ND	0.010	118	119	0.686	114	114	0	70 - 130	70 - 130
g-BHC	ND	0.010	95.7	95.8	0.157	86.4	86.5	0.0659	70 - 130	70 - 130
p,p-DDT	ND	0.025	94.5	93.4	1.20	82.9	81.4	1.82	70 - 130	70 - 130
Dieldrin	ND	0.025	109	108	0.0492	94.8	95	0.160	70 - 130	70 - 130
Endrin	ND	0.025	106	106	0	91.4	91.6	0.298	70 - 130	70 - 130
Heptachlor	ND	0.010	102	103	0.494	93.6	93.7	0.169	70 - 130	70 - 130
%SS:	102	0.050	100	101	1.12	96	96	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19000 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511310-004A	11/15/05 12:40 PM	11/16/05	11/17/05 4:33 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511310

EPA Method: SW8015C **Extraction: SW3550C** **BatchID: 19020** **Spiked Sample ID: 0511271-008A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	20	105	103	1.79	103	103	0	70 - 130	70 - 130
%SS:	103	50	103	102	0.511	106	105	0.795	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19020 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511310-001A	11/15/05 12:00 PM	11/16/05	11/17/05 4:44 AM	0511310-002A	11/15/05 12:15 PM	11/16/05	11/17/05 5:52 AM
0511310-003A	11/15/05 10:45 AM	11/16/05	11/17/05 7:00 AM	0511310-005A	11/15/05 11:05 AM	11/16/05	11/17/05 7:32 PM
0511310-006A	11/15/05 11:20 AM	11/16/05	11/17/05 8:41 PM	0511310-007A	11/15/05 11:45 AM	11/16/05	11/19/05 9:23 AM
0511310-008A	11/15/05 1:10 PM	11/16/05	11/18/05 1:14 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511310

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 19021 Spiked Sample ID: 0511270-003A

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex) £	ND	0.60	105	104	0.855	109	100	8.85	70 - 130	70 - 130
MTBE	ND	0.10	86.9	90.6	4.15	87.1	92	5.47	70 - 130	70 - 130
Benzene	ND	0.10	94.1	94.1	0	91.9	102	9.94	70 - 130	70 - 130
Toluene	ND	0.10	82.8	81.6	1.38	84.9	92.1	8.06	70 - 130	70 - 130
Ethylbenzene	ND	0.10	107	107	0	109	118	7.93	70 - 130	70 - 130
Xylenes	ND	0.30	96	96	0	100	107	6.45	70 - 130	70 - 130
%SS:	90	0.10	106	107	0.256	103	105	2.23	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19021 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511310-001A	11/15/05 12:00 PM	11/16/05	11/16/05 10:00 PM	0511310-002A	11/15/05 12:15 PM	11/16/05	11/16/05 10:30 PM
0511310-003A	11/15/05 10:45 AM	11/16/05	11/16/05 9:35 PM	0511310-005A	11/15/05 11:05 AM	11/16/05	11/17/05 9:49 PM
0511310-006A	11/15/05 11:20 AM	11/16/05	11/17/05 8:42 PM	0511310-007A	11/15/05 11:45 AM	11/16/05	11/17/05 7:01 PM
0511310-008A	11/15/05 1:10 PM	11/16/05	11/18/05 8:03 AM	0511310-009A	11/15/05 11:35 AM	11/16/05	11/18/05 5:10 AM
0511310-010A	11/15/05 1:40 PM	11/16/05	11/16/05 10:08 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511310

EPA Method: SW8015C	Extraction: SW3550C	BatchID: 19036	Spiked Sample ID: 0511310-010A

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	1	20	103	105	1.27	105	106	0.291	70 - 130	70 - 130
%SS:	101	50	100	98	1.72	109	109	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19036 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511310-009A	11/15/05 11:35 AM	11/16/05	11/17/05 1:19 AM	0511310-010A	11/15/05 1:40 PM	11/16/05	11/17/05 3:35 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644 _____ QA/QC Officer

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QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511310

EPA Method: SW8260B **Extraction: SW5030B** **BatchID: 19038** **Spiked Sample ID: 0511310-008A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
tert-Amyl methyl ether (TAME)	ND	0.050	105	104	1.34	111	102	7.69	70 - 130	70 - 130
Benzene	ND	0.050	98.3	97	1.27	102	93.4	9.18	70 - 130	70 - 130
t-Butyl alcohol (TBA)	ND	0.25	90.5	89.1	1.56	98.6	91.4	7.62	70 - 130	70 - 130
Chlorobenzene	ND	0.050	99.9	99.7	0.224	100	93.5	6.82	70 - 130	70 - 130
1,2-Dibromoethane (EDB)	ND	0.050	103	103	0	103	97.3	5.82	70 - 130	70 - 130
1,2-Dichloroethane (1,2-DCA)	ND	0.050	110	109	0.839	111	106	4.86	70 - 130	70 - 130
1,1-Dichloroethene	ND	0.050	98.7	98.7	0	103	93.7	9.59	70 - 130	70 - 130
Diisopropyl ether (DIPE)	ND	0.050	103	102	0.203	107	97.7	9.43	70 - 130	70 - 130
Ethyl tert-butyl ether (ETBE)	ND	0.050	96.2	95.9	0.341	103	94.2	8.52	70 - 130	70 - 130
Methyl-t-butyl ether (MTBE)	ND	0.050	94.3	94.8	0.532	98.5	92.7	6.09	70 - 130	70 - 130
Toluene	ND	0.050	105	105	0	107	99.9	6.88	70 - 130	70 - 130
Trichloroethene	ND	0.050	93.3	92.3	1.11	95.3	88.2	7.74	70 - 130	70 - 130
%SS1:	98	0.050	98	100	2.00	100	98	1.14	70 - 130	70 - 130
%SS2:	103	0.050	100	99	0.709	100	99	0.538	70 - 130	70 - 130
%SS3:	104	0.050	107	104	2.05	102	105	2.77	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19038 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511310-008A	11/15/05 1:10 PM	11/16/05	11/16/05 3:50 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

DHS Certification No. 1644 _____QA/QC Officer

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QC SUMMARY REPORT FOR SW8151A

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511310

EPA Method: SW8151A	Extraction: SW3550C	BatchID: 19037	Spiked Sample ID 0511310-004A

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
2,4-D (Dichlorophenoxyacetic a	ND	0.10	116	92.6	22.3	90.1	117	25.8	60 - 140	60 - 140
2,4-DB	ND	0.10	97.5	98.2	0.713	85.1	86.1	1.27	60 - 140	60 - 140
Dalapon	ND	0.10	91.5	82	10.9	81.8	96.7	16.7	60 - 140	60 - 140
Dicamba	ND	0.10	97	91.5	5.84	87.3	94.5	7.94	60 - 140	60 - 140
2,4,5-TP (Silvex)	ND	0.10	84.4	84.9	0.632	81.9	90.4	9.86	60 - 140	60 - 140
%SS:	89	0.10	90	83	7.35	88	95	7.79	60 - 140	60 - 140

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19037 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511310-004A	1/15/05 12:40 PM	11/16/05	11/19/05 6:52 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

JR QA/QC Officer

051310

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CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

EDF Required? ☒ Yes ☐ No

Report To: Jeremy Smith Bill To: same P.O. #100024
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 E-Mail: jasmith@aeiconsultants.com
Tele: (925) 283-6000 Fax: (925) 283-6121
Project #: 115132 Project Name: Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road
Sampler Signature: Adrian Nero

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	TPH Multi-Range (8015)	Total Petroleum Hydrocarbons (418.1)	SVOCs 8270	Organochlorine Pesticides 8080/8081	Herbicides EPA Method 8051	VOCs 8260	EPA 624 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Composite Prior to Analysis	Other	Other	Other	Other	Comments
SB-5-25'		11/15/05	12:00	1	B		X				X				X	X	X														X				P.O# 100024
SB-6-6"			12:15	1	R		X										X																		
SB-8-8"			10:45	1	A												X																		
Comp-1			12:40	4	S															X	X									X					
SB-9-10"			11:05	1	S												X																		
SB-10-12"			11:20	1													X																		
SB-11-12"			11:45	1													X																		
SB-7-12"			1:10	1													X					X													
SB-12-10"			11:35	1													X																		
SB-13-6"			13:40	1													X																		

Relinquished By:	Date:	Time:	Received By:
Adrian Nero	11/16/05	9:30	[illegible]
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t° ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT
DECHLORINATED IN LAB
PRESERVATION APPROPRIATE ✓
CONTAINERS ✓
PERSERVED IN LAB

VOAS	O&G	METALS	OTHER

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0511310 **ClientID: AEL** **EDF: YES**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #115132
PO: #100024

Bill to
Diane
All Environmental, Inc.
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 5 days
Date Received: 1/16/2005
Date Add-On: 1/22/2005
Date Printed: 1/22/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0511310-006	SB-10-12"	Soil	11/15/2005	☐	A											

Test Legend:

1	8260B_S	2		3		4		5	
6		7		8		9		10	
11		12							

Prepared by: Maria Venegas

Comments: 8260 added on to sample 006 (SB-10-12") 11/22/05 std tat per fax.

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.

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AEI Consultants	Client Project ID: #115132	Date Sampled: 11/15/05
2500 Camino Diablo, Ste. #200		Date Received: 11/16/05
	Client Contact: Jeremy Smith	Date Extracted: 11/22/05
Walnut Creek, CA 94597	Client P.O.: #100024	Date Analyzed: 11/28/05

Volatile Organics by P&T and GC/MS (Basic Target List)*

Extraction Method: SW5030B Analytical Method: SW8260B Work Order: 0511310

Lab ID	0511310-006A
Client ID	SB-10-12"
Matrix	Soil

Compound	Concentration *	DF	Reporting Limit	Compound	Concentration *	DF	Reporting Limit
Acetone	ND<100	2000	0.05	Acrolein (Propenal)	ND<100	2000	0.05
Acrylonitrile	ND<40	2000	0.02	tert-Amyl methyl ether (TAME)	ND<10	2000	0.005
Benzene	14	2000	0.005	Bromobenzene	ND<10	2000	0.005
Bromochloromethane	ND<10	2000	0.005	Bromodichloromethane	ND<10	2000	0.005
Bromoform	ND<10	2000	0.005	Bromomethane	ND<10	2000	0.005
2-Butanone (MEK)	ND<40	2000	0.02	t-Butyl alcohol (TBA)	ND<100	2000	0.05
n-Butyl benzene	ND<10	2000	0.005	sec-Butyl benzene	ND<10	2000	0.005
tert-Butyl benzene	ND<10	2000	0.005	Carbon Disulfide	ND<10	2000	0.005
Carbon Tetrachloride	ND<10	2000	0.005	Chlorobenzene	ND<10	2000	0.005
Chloroethane	ND<10	2000	0.005	2-Chloroethyl Vinyl Ether	ND<20	2000	0.01
Chloroform	ND<10	2000	0.005	Chloromethane	ND<10	2000	0.005
2-Chlorotoluene	ND<10	2000	0.005	4-Chlorotoluene	ND<10	2000	0.005
Dibromochloromethane	ND<10	2000	0.005	1,2-Dibromo-3-chloropropane	ND<10	2000	0.005
1,2-Dibromoethane (EDB)	ND<10	2000	0.005	Dibromomethane	ND<10	2000	0.005
1,2-Dichlorobenzene	ND<10	2000	0.005	1,3-Dichlorobenzene	ND<10	2000	0.005
1,4-Dichlorobenzene	ND<10	2000	0.005	Dichlorodifluoromethane	ND<10	2000	0.005
1,1-Dichloroethane	ND<10	2000	0.005	1,2-Dichloroethane (1,2-DCA)	ND<10	2000	0.005
1,1-Dichloroethene	ND<10	2000	0.005	cis-1,2-Dichloroethene	ND<10	2000	0.005
trans-1,2-Dichloroethene	ND<10	2000	0.005	1,2-Dichloropropane	ND<10	2000	0.005
1,3-Dichloropropane	ND<10	2000	0.005	2,2-Dichloropropane	ND<10	2000	0.005
1,1-Dichloropropene	ND<10	2000	0.005	cis-1,3-Dichloropropene	ND<10	2000	0.005
trans-1,3-Dichloropropene	ND<10	2000	0.005	Diisopropyl ether (DIPE)	ND<10	2000	0.005
Ethylbenzene	26	2000	0.005	Ethyl tert-butyl ether (ETBE)	ND<10	2000	0.005
Freon 113	ND<200	2000	0.1	Hexachlorobutadiene	ND<10	2000	0.005
Hexachloroethane	ND<10	2000	0.005	2-Hexanone	ND<10	2000	0.005
Isopropylbenzene	ND<10	2000	0.005	4-Isopropyl toluene	ND<10	2000	0.005
Methyl-t-butyl ether (MTBE)	ND<10	2000	0.005	Methylene chloride	ND<10	2000	0.005
4-Methyl-2-pentanone (MIBK)	ND<10	2000	0.005	Naphthalene	11	2000	0.005
Nitrobenzene	ND<200	2000	0.1	n-Propyl benzene	ND<10	2000	0.005
Styrene	ND<10	2000	0.005	1,1,1,2-Tetrachloroethane	ND<10	2000	0.005
1,1,2,2-Tetrachloroethane	ND<10	2000	0.005	Tetrachloroethene	ND<10	2000	0.005
Toluene	88	2000	0.005	1,2,3-Trichlorobenzene	ND<10	2000	0.005
1,2,4-Trichlorobenzene	ND<10	2000	0.005	1,1,1-Trichloroethane	ND<10	2000	0.005
1,1,2-Trichloroethane	ND<10	2000	0.005	Trichloroethene	ND<10	2000	0.005
Trichlorofluoromethane	ND<10	2000	0.005	1,2,3-Trichloropropane	ND<10	2000	0.005
1,2,4-Trimethylbenzene	48	2000	0.005	1,3,5-Trimethylbenzene	30	2000	0.005
Vinyl Chloride	ND<10	2000	0.005	Xylenes	290	2000	0.005

Surrogate Recoveries (%)			
%SS1:	100	%SS2:	95
%SS3:	106		

Comments:

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L, wipe samples in µg/wipe.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to high organic content/matrix interference; k) reporting limit near, but not identical to our standard reporting limit due to variable Encore sample weight; m) reporting limit raised due to insufficient sample amount; n) results are reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644 _____ Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0511310

EPA Method: SW8260B **Extraction: SW5030B** **BatchID: 19144** **Spiked Sample ID: 0511415-001A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
tert-Amyl methyl ether (TAME)	ND	0.050	106	108	1.72	111	109	2.11	70 - 130	70 - 130
Benzene	ND	0.050	97	101	3.67	102	98.3	3.44	70 - 130	70 - 130
t-Butyl alcohol (TBA)	ND	0.25	89.1	96.2	7.63	95.1	90.4	5.11	70 - 130	70 - 130
Chlorobenzene	ND	0.050	102	100	1.33	104	98.1	5.52	70 - 130	70 - 130
1,2-Dibromoethane (EDB)	ND	0.050	105	103	2.25	108	103	4.52	70 - 130	70 - 130
1,2-Dichloroethane (1,2-DCA)	ND	0.050	109	111	1.92	112	109	2.44	70 - 130	70 - 130
1,1-Dichloroethene	ND	0.050	91.9	94.7	2.96	97.9	95	2.98	70 - 130	70 - 130
Diisopropyl ether (DIPE)	ND	0.050	104	104	0	106	105	1.58	70 - 130	70 - 130
Ethyl tert-butyl ether (ETBE)	ND	0.050	98	99.2	1.20	98.9	98	0.884	70 - 130	70 - 130
Methyl-t-butyl ether (MTBE)	ND	0.050	96.9	97.5	0.594	99.3	98.3	1.03	70 - 130	70 - 130
Toluene	ND	0.050	107	105	1.98	108	104	3.41	70 - 130	70 - 130
Trichloroethene	ND	0.050	90.5	93.7	3.51	93.2	91.5	1.85	70 - 130	70 - 130
%SS1:	85	0.050	99	100	1.05	100	99	0.620	70 - 130	70 - 130
%SS2:	91	0.050	101	99	1.77	101	99	2.28	70 - 130	70 - 130
%SS3:	102	0.050	109	110	1.11	110	110	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 19144 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0511310-006A	11/15/05 11:20 AM	11/22/05	11/28/05 7:37 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

DHS Certification No. 1644 _____QA/QC Officer

aei 0512200

RUSH!

McCAMPBELL ANALYTICAL INC.

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PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME: ☐ RUSH ☒ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAY

EDF Required? ☐ Yes ☒ No

Report To: Jeremy Smith Bill To: same P.O. #100087
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 E-Mail: jasmith@aeiconsultants.com
Tele: (925) 283-6000 Fax: (925) 283-6121
Project #: 115132 Project Name: Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road
Sampler Signature:

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX Method 8021 + MTBE	TPH as Diesel (8015)	TPH Multi-Range (8015)	Total Petroleum Hydrocarbons (418.1)	SVOCs 8270	Organochlorine Pesticides 8080/8081	Herbicides EPA Method 8051	VOCs 8260	EPA 624 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Composite Prior to Analysis	Other	Comments
SB-14-4		12/12/05	840	1			X										~~X~~ NO														X	P.O# 100087
SB-14-8			845	1			X										X															
SB-14-12			850	1			X							NO			X															
SB-14-15			900	1			X																								X	
SB-14-19			910	1			X																								X	
SB-14			930	5		X									X		X															
SB-15-4			935	1			X								X		X															
SB-15-8			945	1			X																								X	
SB-15-12			950	1			X								X		X															
SB-16-4			1010	1			X																								X	
SB-16-8			1015	1			X																								X	
SB-16-12			1020	1			X								X		X															
SB-17-4			1030	1			X																								X	
SB-17-8			1035	1			X										X															

HOLD

Relinquished By:	Date:	Time:	Received By:
	12/12	1655	Franciscita Veerges
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t°_____ GOOD CONDITION_____ HEAD SPACE ABSENT_____ DECHLORINATED IN LAB_____

PRESERVATION_____ APPROPRIATE CONTAINERS_____ PERSERVED IN LAB_____

VOAS	O&G	METALS	OTHER

McCAMPBELL ANALYTICAL INC.

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CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☒ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAY

EDF Required? ☐ Yes ☒ No

Report To: Jeremy Smith **Bill To:** same **P.O. #100087**
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 **E-Mail:** jasmith@aeiconsultants.com
Tele: (925) 283-6000 **Fax:** (925) 283-6121
Project #: 115132 **Project Name:** Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road
Sampler Signature:

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX Method 8021 + MTBE	TPH as Diesel (8015)	TPH Multi-Range (8015)	Total Petroleum Hydrocarbons (418.1)	SVOCs 8270	Organochlorine Pesticides 8080/8081	Herbicides EPA Method 8051	VOCs 8260	EPA 624 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Composite Prior to Analysis	Other: HOLD			Comments
SB-17-12		12/12/05	1045	1			X										~~X~~ YES																	P.O# 100087
SB-17			1050	3		X									X		X																	
SB-18-4			1100	1			X																								X			
SB-18-8			1105	1			X								X		X																	
SB-18-12			1110	1			X										X																	
SB-19-4			1215	1			X																								X			
SB-19-8			1220	1			X								X		X																	
SB-19-12			1230	1			X										X																	
SB-19			1245	4		X									X																			
SB-20-4			1300	1			X																								X			
SB-20-8			1305	1			X																								X			
SB-20-11			1315	1			X								X		X																	
SB-20			1330	4		X									X																			

Relinquished By:	Date:	Time:	Received By:
	12/12/05	1655	Franciti Veregos
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t°_____ PRESERVATION_____ VOAS | O&G | METALS | OTHER
GOOD CONDITION_____ APPROPRIATE
HEAD SPACE ABSENT_____ CONTAINERS_____
DECHLORINATED IN LAB_____ PERSERVED IN LAB_____

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☒ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAY

EDF Required? ☐ Yes ☒ No

Report To: Jeremy Smith **Bill To:** same **P.O. #**100087
Company: AEI Consultants
2500 Camino Diablo, Suite 200
Walnut Creek, CA 94597 **E-Mail:** jasmith@aeiconsultants.com
Tele: (925) 283-6000 **Fax:** (925) 283-6121
Project #: 115132 **Project Name:** Thomas Properties
Project Location: Brentwood Blvd. & Sand Creek Road
Sampler Signature:

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	HCl	HNO_3	Other	BTEX Method 8021	TPH as Diesel (8015)	TPH Multi-Range (8015)	Total Petroleum Hydrocarbons (418.1)	SVOCs 8270	Organochlorine Pesticides 8080/8081	Herbicides EPA Method 8051	VOCs 8260	EPA 624 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Composite Prrior to Analysis	HOLD			Comments
															ENTIRE																			
SB-21-8		12/12	1345	1			X								X		~~X~~ YES																	
SB-21-11			1350	1			X																								X			
SB-21			1415	5		X									X		X																	
SB-22			1430	5		X									X		X																	

P.O# 100087

Relinquished By:	Date:	Time:	Received By:
	12/12/05	1655	Jennifer Verlegaas
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t°_____ PRESERVATION_____ VOAS | O&G | METALS | OTHER
GOOD CONDITION_____ APPROPRIATE
HEAD SPACE ABSENT_____ CONTAINERS_____
DECHLORINATED IN LAB_____ PERSERVED IN LAB_____

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0512200 **ClientID: AEL** **EDF: NO**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #115132; Thomas Properties
PO: 100087

Bill to
Joanne Bryant
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 1 day

Date Received: 12/12/2005
Date Printed: 12/12/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0512200-002	SB-14-8	Soil	12/12/2005	☐	A											
0512200-003	SB-14-12	Soil	12/12/2005	☐	A											
0512200-006	SB-14	Water	12/12/2005	☐		A		B								
0512200-007	SB-15-4	Soil	12/12/2005	☐	A		A									
0512200-009	SB-15-12	Soil	12/12/2005	☐	A		A									
0512200-012	SB-16-12	Soil	12/12/2005	☐	A		A									
0512200-014	SB-17-8	Soil	12/12/2005	☐	A											
0512200-015	SB-17-12	Soil	12/12/2005	☐	A											
0512200-016	SB-17	Water	12/12/2005	☐		A		B								
0512200-018	SB-18-8	Soil	12/12/2005	☐	A		A									
0512200-019	SB-18-12	Soil	12/12/2005	☐	A											
0512200-021	SB-19-8	Soil	12/12/2005	☐	A		A									
0512200-022	SB-19-12	Soil	12/12/2005	☐	A											
0512200-023	SB-19	Water	12/12/2005	☐		A										
0512200-026	SB-20-11	Soil	12/12/2005	☐	A		A									

Test Legend:

1	G-MBTEX_S	2	G-MBTEX_W	3	TPH(DMO)_S	4	TPH(DMO)_W	5	
6		7		8		9		10	
11		12							

Prepared by: Rosa Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0512200 **ClientID: AEL** **EDF: NO**

Report to:
Jeremy Smith
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #115132; Thomas Properties
PO: 100087

Bill to
Joanne Bryant
AEI Consultants
2500 Camino Diablo, Ste. #200
Walnut Creek, CA 94597

Requested TAT: 1 day

Date Received: 12/12/2005
Date Printed: 12/12/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
0512200-027	SB-20	Water	12/12/2005	☐		A										
0512200-028	SB-21-8	Soil	12/12/2005	☐	A		A									
0512200-030	SB-21	Water	12/12/2005	☐		A		B								
0512200-031	SB-22	Water	12/12/2005	☐		A		B								

Test Legend:

1	G-MBTEX_S	2	G-MBTEX_W	3	TPH(DMO)_S	4	TPH(DMO)_W	5	
6		7		8		9		10	
11		12							

Prepared by: Rosa Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

AEI Consultants	Client Project ID: #115132; Thomas Properties	Date Sampled: 12/12/05
2500 Camino Diablo, Ste. #200		Date Received: 12/12/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted: 12/12/05-12/13/05
	Client P.O.: 100087	Date Analyzed: 12/13/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0512200

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
002A	SB-14-8	S	150,m	---	---	---	---	---	20	101
003A	SB-14-12	S	1900,m	---	---	---	---	---	100	114
006A	SB-14	W	65,000,a,h	ND<500	1900	3000	2000	12,000	100	107
007A	SB-15-4	S	1100,b,m	ND<5.0	ND<0.50	ND<0.50	18	89	100	103
009A	SB-15-12	S	10,000,a	ND<50	110	ND<5.0	210	1200	1000	109
012A	SB-16-12	S	130,m	ND<1.0	ND<0.10	ND<0.10	2.8	ND<0.10	20	96
014A	SB-17-8	S	78,m	---	---	---	---	---	2	100
015A	SB-17-12	S	1800,m	---	---	---	---	---	200	114
016A	SB-17	W	26,000,b,m,h	ND<170	22	ND<17	1700	4400	33	103
018A	SB-18-8	S	26,b,m	ND	0.0071	ND	0.76	0.16	1	114
019A	SB-18-12	S	270,m	---	---	---	---	---	100	116
021A	SB-19-8	S	1000,m	ND<5.0	ND<0.50	ND<0.50	3.3	ND<0.50	100	102
022A	SB-19-12	S	400,b,m	---	---	---	---	---	40	119
023A	SB-19	W	---	ND<100	46	ND<10	940	3200	20	111
026A	SB-20-11	S	27,m	ND	ND	ND	0.056	ND	1	87
027A	SB-20	W	---	ND<25	ND<2.5	ND<2.5	34	8.0	5	115
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
		S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

_____Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

AEI Consultants	Client Project ID: #115132; Thomas Properties	Date Sampled: 12/12/05
2500 Camino Diablo, Ste. #200		Date Received: 12/12/05
Walnut Creek, CA 94597	Client Contact: Jeremy Smith	Date Extracted: 12/12/05-12/13/05
	Client P.O.: 100087	Date Analyzed: 12/13/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0512200

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
028A	SB-21-8	S	560,m	ND<10	ND<1.0	ND<1.0	3.4	6.4	200	108
030A	SB-21	W	12,000,b,m,h	ND<50	ND<5.0	ND<5.0	720	1300	10	114
031A	SB-22	W	2200,b,m,h	ND<25	ND<2.5	ND<2.5	ND<2.5	3.7	5	90

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

_____Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #115132; Thomas Properties	Date Sampled: 12/12/05
		Date Received: 12/12/05
	Client Contact: Jeremy Smith	Date Extracted: 12/12/05
	Client P.O.: 100087	Date Analyzed: 12/12/05-12/13/05

Diesel (C10-23) and Oil (C18+) Range Extractable Hydrocarbons as Diesel and Motor Oil*

Extraction method: SW3510C/SW3550C Analytical methods: SW8015C Work Order: 0512200

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	DF	% SS
0512200-002A	SB-14-8	S	40,n/k	ND	1	90
0512200-003A	SB-14-12	S	390,n	11	1	106
0512200-006B	SB-14	W	100,000,d,b,h	2700	10	106
0512200-007A	SB-15-4	S	140,d,b	ND	1	106
0512200-009A	SB-15-12	S	1700,d,b	ND<100	20	101
0512200-012A	SB-16-12	S	51,n/k	ND	1	107
0512200-014A	SB-17-8	S	20,k	ND	1	105
0512200-015A	SB-17-12	S	570,n/k	ND<50	10	100
0512200-016B	SB-17	W	28,000,d,h	ND<2500	10	101
0512200-018A	SB-18-8	S	6.3,d,b	ND	1	104
0512200-019A	SB-18-12	S	230,n/k	6.7	1	103
0512200-021A	SB-19-8	S	1100,n/k	ND<100	20	112
0512200-022A	SB-19-12	S	200,n/k	6.3	1	106
0512200-026A	SB-20-11	S	12,n/k	ND	1	101
0512200-028A	SB-21-8	S	890,n/k	19	2	91
0512200-030B	SB-21	W	19,000,d,h	ND<2500	10	98

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	250	µg/L
	S	1.0	5.0	mg/Kg

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel (asphalt?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range/jet fuel; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

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AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #115132; Thomas Properties	Date Sampled: 12/12/05
		Date Received: 12/12/05
	Client Contact: Jeremy Smith	Date Extracted: 12/12/05
	Client P.O.: 100087	Date Analyzed: 12/12/05-12/13/05

Diesel (C10-23) and Oil (C18+) Range Extractable Hydrocarbons as Diesel and Motor Oil*

Extraction method: SW3510C/SW3550C Analytical methods: SW8015C Work Order: 0512200

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	DF	% SS
0512200-031B	SB-22	W	19,000,n/k,h	ND<2500	10	101

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	250	µg/L
	S	1.0	5.0	mg/Kg

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel (asphalt?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range/jet fuel; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

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AEI Consultants 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #115132; Thomas Properties	Date Sampled: 12/12/05
		Date Received: 12/12/05
	Client Contact: Jeremy Smith	Date Extracted: 12/13/05
	Client P.O.: 100087	Date Analyzed 12/13/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*

Extraction method: SW5030B Analytical methods: SW8015Cm Work Order: 0512200

Lab ID	Client ID	Matrix	TPH(g)	DF	% SS
023A	SB-19	W	32,000,b,m,h	20	111
027A	SB-20	W	6200,b,m,h	5	115

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	NA	NA

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

APPENDIX D

QUALIFICATIONS

Nathan R. Ferguson
Project Manager

BA - Nature and Culture, University of California Davis

Mr. Ferguson has spent the past four years studying a broad range of environmental disciplines, including: natural resource management, environmental planning and environmental policy.

Mr. Ferguson provides project management to ensure ASTM compliance and satisfaction of client requirements for Phase I Environmental Site Assessments, Limited Environmental Assessments, Environmental Transaction Analyses, Transaction Screens, and Database Reviews.

Peter J. McIntyre
Director, Environmental Services

BA - Geology, University of California, Berkeley
OSHA 40-Hour HAZWOPER Training
OSHA 8-Hour HAZWOPER Site Supervisor
California Professional Geologist # 7702
Illinois Licensed Professional Geologist # 196.001173
California Registered Environmental Assessor I (REA) # 07977
Membership Groundwater Resources Association

Mr. McIntyre has over ten years of experience in environmental consulting and engineering services. His project experience includes: Environmental Due Diligence (Transaction Screens, Phase I and Phase II ESAs); soil and groundwater investigation design and implementation; hydrologic assessment and modeling; underground storage tank (UST) removals closure, and compliance; and the development and implementation of remedial action projects. Additional experience includes the design and management of asbestos survey and abatement projects.

Mr. McIntyre is currently a senior project manager for hazardous waste investigation and cleanup in Northern California and director of services nationwide. Responsibilities include client management, project oversight, project design and review, cost estimating and contract preparation, and staff training. Current clients include private property and fuel station owners, property managers, developers, lending and financial institutions, and public agencies.

Mr. McIntyre's project experience includes:

- The design and implementation of numerous soil, soil gas, and groundwater investigations for environmental due diligence for a variety of suspected contaminants, including UST sites, dry-cleaning facilities, plating and galvanizing operations, agricultural operations, and other industrial facilities
- The design and implementation of numerous site investigations and remedial investigations under the direction of various regulatory oversight agencies
- Technical oversight and management for projects in Colorado, Oregon, Texas, Illinois, Florida, and several other states.
- Investigation and mitigation at active gasoline stations with significant free phase and dissolved phase contaminant plumes.
- Design, implementation, and management of various remedial technologies, including, soil vapor extraction / air sparge, dual phase extraction, chemical oxidation, bio-remediation, soil removal, and natural attenuation
- Providing witness testimony and litigation support
- Environmental engineering and consulting services for numerous development and urban infill redevelopment projects, including properties compromised with solvents, metals, petroleum, and agricultural chemicals. Projects have included preparation of preliminary endangerment assessments (PEA) and portions of environmental impact reports (EIR) relating to hazardous materials during development planning, risk evaluations, release characterization and mitigation, and consulting with redevelopment agencies, investors, and regulatory agencies.

APPENDIX K

AEI CONSULTANTS
ENVIRONMENTAL & ENGINEERING SERVICES

2500 Camino Diablo, Walnut Creek, CA 94597
tel 800-801-3224
fax 925-944-2895
www.aeiconsultants.com

October 6, 2008

Raney Planning and Management
Attn: Nick Pappani
1501 Sports Drive
Sacramento, CA 95834

Subject: **RE: Summary Letter – Portion of Sciortino Property**
APN 016-017-013
Brentwood Blvd., @ Sand Creek Road
Brentwood, California
AEI Project No. 271948

Dear Mr. Pappani:

Attached is a copy of the summary letter for the above referenced property. Please contact myself or Peter McIntyre at 925/944-2899, extension 128 or 104 if you have questions or need any additional information.

Sincerely,
AEI Consultants

Jeremy Smith
Project Manager

AEI CONSULTANTS
ENVIRONMENTAL & ENGINEERING SERVICES

2500 Camino Diablo, Walnut Creek, CA 94597
tel 800-801-3224
fax 925-944-2895
www.aeiconsultants.com

October 6, 2008

City of Brentwood
Attn: Erik Nolthenius
708 Third Street
Brentwood, CA 94513

Subject: **RE: Summary Letter – Portion of Sciortino Property**
APN 016-017-013
Brentwood Blvd., @ Sand Creek Road
Brentwood, California
AEI Project No. 271948

Dear Mr. Nolthenius:

The following is a summary of the environmental conditions and progress regarding the petroleum release at the former Sciortino natural gas well area.

Soil Borings November 2005

Following a Phase I Environmental Site Assessment, limited subsurface sampling was performed in the area of process equipment and within and around several above ground storage tanks (ASTs) and drums. Eight shallow soil samples were collected from SB-5 to SB-12. Soil sample analyses indicated that a release of petroleum hydrocarbons occurred in the southwestern corner of the fenced-in area.

Soil Borings December 2005

On December 12, 2005, nine soil borings (SB-14 to SB-22) were drilled for soil and groundwater sample collection. These borings were drilled with direct push sampling equipment and borings continuously logged. Sample analyses identified significantly impacted soil and groundwater. On December 17, 2005, an additional ten borings (SB-23 to SB-32) were drilled to further assess the extent of impacted groundwater with hydro-punch sampling equipment.

Based on the findings of these preliminary assessments, it was concluded that the most likely cause of the release was overfilling or leaking from the large ASTs at the southwestern corner of the fenced area. The highest concentrations of detected petroleum were present in shallow soil within and directly around the gravel berm containing the AST (only one remained as of 2005, however the footings of what appeared to be three other ASTs were apparent). The impact to groundwater was also centered on this area, decreasing with distance from the AST berm.

Trench Investigation May 2007

Additional exploratory trenching was requested to further refine the extent of impacted soil prior to source removal activities. A total of eleven trenches (T1 to T11) were excavated outward from the berm area on May 30 and 31, 2007. The trenches were dug with a backhoe to depths of 10 to 12 feet and soil

samples were collected. The findings were used to generate an Interim Removal Action Plan proposing limited soil excavation to the Regional Water Quality Control Board (RWQCB).

Excavation Activities 4th Quarter 2007 & 1st Quarter 2008

During the 4th Quarter 2007 through April 2008, approximately 18,700 cubic yards of petroleum hydrocarbon contaminated soil were excavated at the subject site. Overall, the excavation was very successful at removing not only significantly contaminated soil and potentially mobile product from the spill area, but much of the residually impacted soil outside of the immediate spill area and at the soil/water interface. In addition, the eastern area that had been previously inaccessible for drilling and trenching exploration (due to the gas processing equipment and underground high pressure gas lines) was now made accessible. Sampling and exploratory trenching was performed in this area beneath the former equipment pad area and additional soil removal conducted toward the eastern side of the property. The impacted soils (approximately 9,000 cubic yards) were removed off-site to a class II facility. Following excavation activities, several confirmation samples had concentrations of petroleum hydrocarbons slightly above environmental screening level (ESL) values.

Current Activities

On September 19, 2008 six additional soil borings were advanced at the site. The borings were evenly spaced from approximately 70 feet to 130 feet outside the perimeter of the excavation beginning on the southeastern portion of the excavation and moving counterclockwise to the north of the excavation. Groundwater and select soil samples indicated that petroleum hydrocarbons were not present at or above the laboratory detection limit with the exception of groundwater from SB-35 where TPHd and TPHmo were detected at relatively low concentrations.

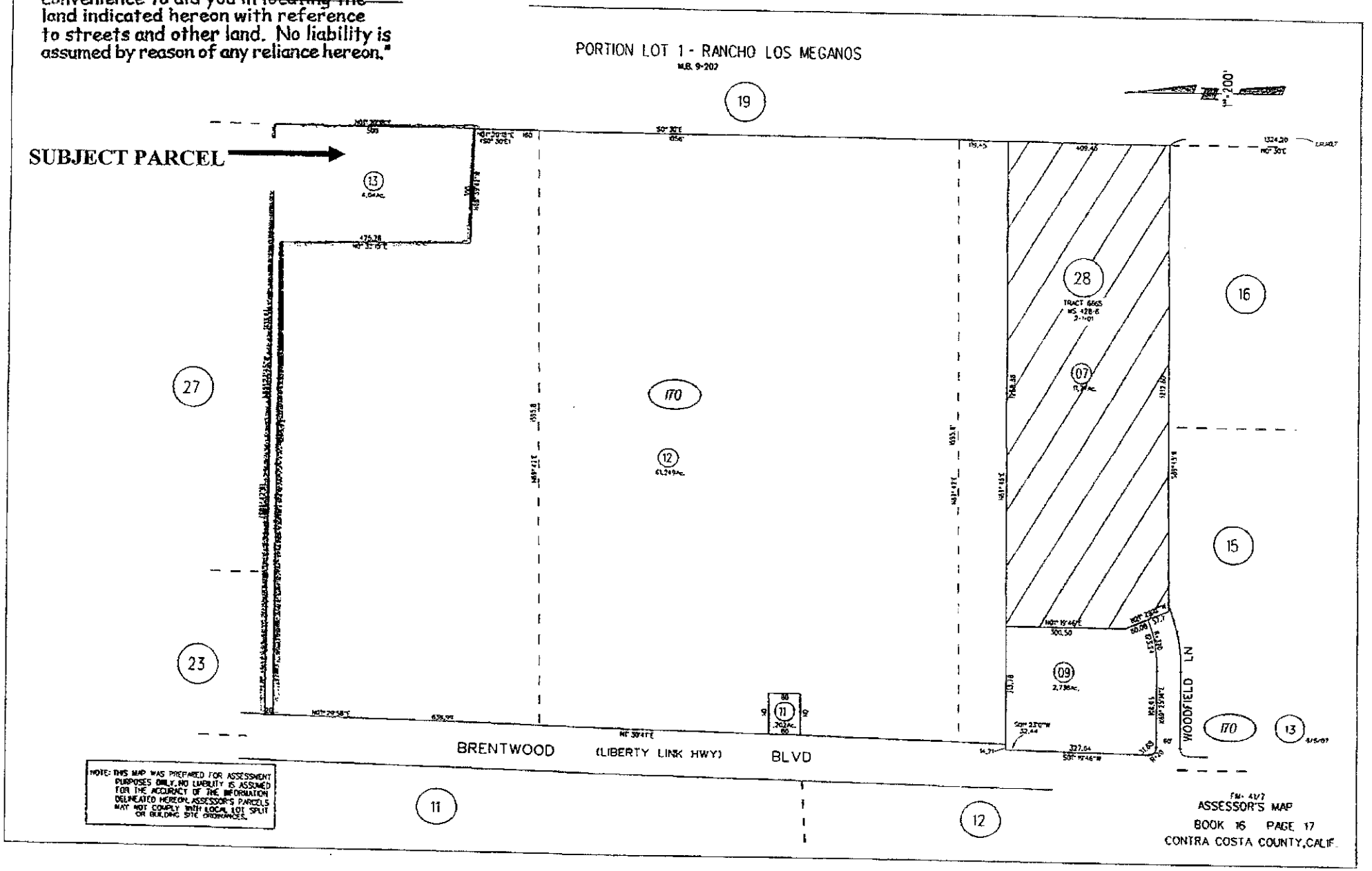
AEI is currently working with the RWQCB to satisfy their requirements for residential level clean-up standards in order to obtain case closure at the site. AEI is currently working with the RWQCB to determine if additional tasks are necessary.

Please contact myself or Peter McIntyre at 925/944-2899, extension 128 or 104 if you have questions or need any additional information.

Sincerely,
AEI Consultants

Jeremy Smith
Project Manager

Attachment: Assessor Parcel Map Highlighting Subject Parcel

cc: Raney Planning and Management
NUCP, LLC

"NOTICE: is neither a plat nor a survey. It is furnished merely as a convenience to aid you in locating the land indicated hereon with reference to streets and other land. No liability is assumed by reason of any reliance hereon."