



PA-1 SPECIFIC PLAN

EXISTING CONDITIONS REPORT | APRIL 2017

PREPARED FOR:

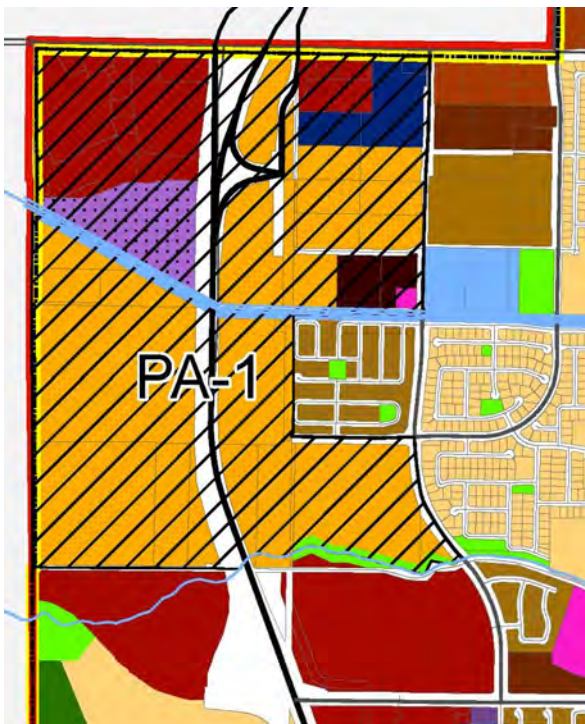
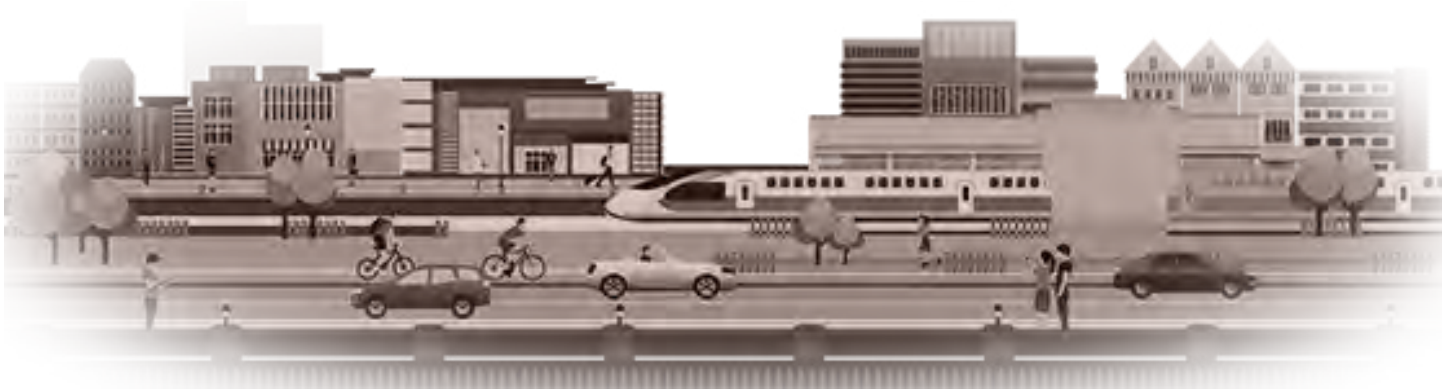
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FOR THE

PRIORITY AREA 1 SPECIFIC PLAN

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The City of Brentwood Priority Area 1 Specific Plan identifies the community’s vision for the future growth, development, and conservation of open space and resources within the Specific Plan Area in a manner consistent with the quality of life desired by residents and businesses. This City of Brentwood Priority Area 1 Specific Plan Existing Conditions Report provides an overview of Brentwood’s physical, environmental, economic, and demographic setting, as of April 2017.

This chapter provides a brief summary of the existing uses and land use designations for the Priority Area 1 Specific Plan and summarizes the site constraints as determined by the sections of this Existing Conditions Report.

LOCATION

The Priority Area 1 Specific Plan area (“Specific Plan Area” or “PA-1 Area”) is located within the northwestern portion of the city of Brentwood. Figure 1.1-1 in Section 1.0, Land Use and Socioeconomics, shows the Brentwood City Limits, the adopted Sphere of Influence (SOI), and the Specific Plan Area. As shown in the figure, the Specific Plan Area is located south of Lone Tree Way, west of Shady Willow Lane, generally north of Sand Creek, and east of Heidorn Ranch Road. State Route (SR) 4 traverses the PA-1 Area from north to south and bisects the area nearly in half.

EXISTING AND SURROUNDING LAND USES

Existing uses within the Specific Plan Area include vacant land, agricultural fields, ranchette homes, and commercial uses (including Lone Tree Plaza and Brentwood Station). The topography of the Specific Plan Area is characterized by the relatively flat terrain typical of the Central Valley, with a few gently sloping hills beyond the southern and western portions of the Specific Plan Area, near the foothills of the Diablo Range.

The Specific Plan Area is approximately 431.27 acres in size. As shown in Figure 1.1-1, the majority of the Specific Plan Area is currently designated Mixed Use Pedestrian Transit (MUPT, 248.75 acres). Other land uses within the Specific Plan Area include Regional Commercial (RC, 62.00 acres), Planned Development (PD, 23.07 acres), Residential-Very High Density (R-VHD, 8.98 acres), Semi-Public Facility (SPF, 16.83 acres), and Public Facility (PF, 0.99 acre). Additionally, the Specific Plan Area has a Priority Area overlay designation. A Priority Area is an overlay designation that identifies an area of the city that warrants particular attention with respect to the land use mix, jobs/housing balance, and overall design and integration of future development projects. In addition to the parcel-specific land use designations assigned to all parcels within a Priority Area, a Priority Area overlay designation establishes a set of overarching guidance policies that shall be used by the City to ensure quality and integrated development that assists in meeting the economic development goals of the General Plan. Development within a Priority Area shall be consistent with the underlying land use designations.

Figure 1.1-2 in Section 1.0 shows the nearby land uses within the cities of Oakley and Antioch. The areas to the north, northwest, and west of the Specific Plan Area are located within the city of Antioch. Adjoining lands to the north of the Specific Plan Area are within the East Lone Tree Focus Area. The East Lone Tree Focus Area encompasses approximately 796 acres in the eastern portion of the city of Antioch. The East Lone Tree Focus Area is intended to provide substantial employment and retail opportunities for the City of Antioch. Land use designations within the East Lone Tree Focus Area include Public, Office/Retail, Residential/Open Space, High Density Residential, Regional Commercial, Regional Retail, Regional Retail/Employment-Generating Lands, and Open Space/Public. Land use designations within the East Lone Tree Focus Area which are immediately adjacent north of the Specific Plan Area include High Density Residential, Regional Commercial, and Regional Retail.

Adjoining lands to the west of the Specific Plan Area are designated Medium Density Residential, High Density Residential, and Open Space by the Antioch General Plan. Additionally, land to the west of the Specific Plan Area is within the Sand Creek Focus Area. The Sand Creek Focus Area encompasses approximately 2,712 acres in the southern portion of the city of Antioch. The Sand Creek Focus Area is intended to function as a large-scale planned community, providing additional housing and employment opportunities for the city of Antioch. Land use designations within the Sand Creek Focus Area include Open Space, Hillside and Estate Residential, Golf Course/Senior Housing/Open Space, Estate and Executive Residential/Open Space, Low Density Residential, Commercial/Open Space, Mixed Use Medical Facility, Multiple Family, School, Business Park, Public/Quasi-Public, and Open Space/Senior Housing. Land use designations within the Sand Creek Focus Area which are immediately adjacent west of the Specific Plan Area include Business Park, Public/Quasi-Public, and Open Space/Senior Housing. The City of Antioch recently approved three separate single-family residential projects in this area, totaling 1,291 units.

DEVELOPMENT CONSTRAINTS AND OPPORTUNITIES

The following section summarizes the development constraints and land use opportunities for the Specific Plan Area.

SOCIOECONOMICS

The Priority Area 1 Specific Plan represents an important component of the city of Brentwood's land available for future development under the City's General Plan. The Specific Plan Area is important because of its position at a key location along SR 4, and because it represents a significant portion of the City's overall developable land supply.

Table 1.3-4 in Section 1.0 shows the development capacity of the job-generating land uses (i.e., commercial, office, and industrial) within the Specific Plan Area and the remainder of the city. As shown in the table, the Specific Plan Area has a development capacity of up to 1,693,642 square feet (sf) of commercial uses, 740,344 sf of office uses, and 740,344 sf of industrial uses. Additionally, as shown in Table 1.3-6 in Section 1.0, the Specific Plan Area has a development capacity of up to 1,443 multi-family residential units.

It is important for cities to develop land use patterns that can balance residential development opportunities to help address the region's burgeoning demand for new housing with provision of locations for new and growing businesses that can provide jobs for local residents and help to diversify the City's revenue base to be able to support high quality local services. The City of Brentwood has historically captured strong demand for new residential development, but has had more limited success with attracting jobs (particularly higher wage jobs that require higher skills).

The City faces a potential shortage of development capacity to accommodate its full potential for economic development related to industrial/manufacturing activities. Land designated for industrial uses in Priority Area 1 represents a critical piece of the city's available development capacity for these uses in terms of both the quantity of development capacity and the quality of the location. Although current market pressures may encourage residential development in the short term, the City will not likely benefit from re-designating industrial land in the Specific Plan Area to allow housing development in the short term. Such a move might result in adverse impacts to the orderly development of other residential developments already planned within the city, which appear more than adequate to meet

anticipated demand in the next several decades.¹ At the same time, a loss of land designated for industrial development would exacerbate the potential for the City to run into a shortfall of land to accommodate economic development opportunities.

CIRCULATION

The Contra Costa Transportation Authority (CCTA) has designated a regional system of streets that it has determined are critical to regional transportation in Contra Costa County and connectivity to neighboring counties. In the vicinity of the Specific Plan Area, designated Routes of Regional Significance include SR 4 that is operated and maintained by Caltrans, as well as Lone Tree Way and Sand Creek Road. Other Specific Plan Area roadways include Heidorn Ranch Road, Jeffery Way, Shady Willow Lane, Amber Lane, and Empire Avenue.

Tri Delta Transit and Bay Area Rapid Transit (BART) provide transit services within Contra Costa County. Tri Delta Transit operates four routes that serve the Specific Plan Area: Route 380, Route 383, Route 385, and Route 395. Currently, the nearest BART station is located in Pittsburg/Bay Point; however, a supplementary service, eBART, is under construction to connect communities east of Pittsburg with BART. Currently, the extension to Antioch is under construction and is expected to begin service in winter 2017/2018. There are also long-term plans to extend the eBART service beyond Antioch. In 2014, a report was published titled *eBART Next Segment Study* which explored the options for an extension of the eBART project beyond the Antioch Station at Hillcrest Avenue. The study suggested multiple potential station locations in Brentwood, one of which is within the center of the Specific Plan Area.

The Mokelumne Coast Trail is a Class I multi-use trail and is identified as a regional trail in the *Countywide Bicycle and Pedestrian Master Plan*. Segments of the trail currently exist east and west of the Specific Plan Area boundaries, and future plans for the trail include a connection through the Specific Plan Area with a bicycle-pedestrian overcrossing at SR 4.

SAFETY

There are no specific or noteworthy safety-related constraints in the Specific Plan Area.

There are no sites listed in the California Department of Toxic Substances Control (DTSC) *Envirostor Data Management System* database within the Specific Plan Area. There are six sites listed in the Envirostor database within one mile of the Specific Plan Area, only one of which has an active status. The Skipolini Property, located approximately 0.97 mile east of the Specific Plan Area, is a voluntary cleanup site with an active status. Additionally, the Specific Plan Area is not on the Hazardous Waste and Substances Sites (Cortese) List or within the Solid Waste Information System (SWIS) database.

There are no known active or potentially active faults located within the city of Brentwood or in the Specific Plan Area. However, there are numerous active faults located in the regional vicinity of Brentwood. As shown in Figure 5.4-2 in Section 2.0, liquefaction potential in the Specific Plan Area is designated as “medium.” Additionally, the Specific Plan Area has a moderately low to moderate potential for erosion. The majority of the Specific Plan Area has moderate or high expansive soils, including most of the undeveloped land. A small part of the south-central and southeastern portion of

¹ According to Table 2.0-2 of the City’s General Plan Draft EIR, the City of Brentwood could accommodate 9,972 new housing units upon full buildout of the General Plan. Over 8,000 of these new housing units would be located outside of the Specific Plan Area.

the Specific Plan Area has low expansive soils. The areas with moderate to high expansive soils would require special design considerations due to shrink-swell potentials.

Given the relatively level slopes throughout the Specific Plan Area, the landslide and lateral spreading potential is very low. This is not a significant constraint in the Specific Plan Area. Additionally, subsidence in the city of Brentwood, which includes the Specific Plan Area, has not been considered a significant issue, although Delta lands to the north and east of the city will continue to be a significant concern.

NATURAL RESOURCES

As noted in Section 5.1 of Section 5.0 (Conservation), no prehistoric sites, historic sites, or historic buildings have been recorded within the Specific Plan Area.

As shown in Figure 5.2-1 in Section 5.0, there are 13 cover types (wildlife habitat classifications) in the Specific Plan Area out of 59 found in the State. These include: AGS – Annual Grassland, BAR – Barren, CRP – Cropland, DOR – Deciduous Orchard, DGR – Dryland Grain Crops, EOR - Evergreen Orchard, IGR – Irrigated Grain Crops, IRH – Irrigated Hayfield, IRF – Irrigated Row and Field Crop, PAS – Pasture, URB – Urban, VIN – Vineyard, and VRI – Valley Foothill Riparian.

As shown in Figure 5.2-2 in Section 5.0, six special-status plant species and five special-status animal species have documented occurrences within one mile of the Specific Plan Area. Additionally, zero sensitive natural communities exist within one mile of the Specific Plan Area.

As noted previously, Sand Creek is located generally south of the southern Specific Plan Area boundary. The Specific Plan Area does not include any water bodies listed on the Section 303(d) list of impaired water bodies. As shown in Figure 5.6-1 in Section 5.0, a small portion of the southern boundary of the Specific Plan Area is located within a 100-year flood zone (area that is adjacent to Sand Creek). Additionally, in the unlikely event of dam failure, the Los Vaqueros Dam, Marsh Creek Dam, Deer Creek Dam, and Dry Creek Dam are identified as having the potential to inundate habitable portions of the city of Brentwood (including the Specific Plan Area). The dam owners/operators, Contra Costa Water District and Contra Costa County Flood Control and Water Conservation District, are responsible for the management, monitoring, and improvements to these dams to reduce the risk of dam failure and inundation.

As noted in Section 5.7 of Section 5.0, there are two officially designated scenic highway corridors in Contra Costa County: Interstate 680, from the Alameda County line to the junction with SR 24; and SR 24 from the east portal of the Caldecott tunnel to Interstate 680 near Walnut Creek. Neither of these officially designated scenic highway corridors provide views of Brentwood or the immediate surrounding areas.

There is, however, one Eligible State Scenic Highway Corridor within and adjacent to Brentwood that has not been officially designated. SR 4, west of the junction with Byron Highway to the junction with SR 160 in Antioch, is designated as an Eligible State Scenic Highway Corridor. A portion of this section of SR 4 is located within the Specific Plan Area. The status of a proposed state scenic highway changes from eligible to officially designated when the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated a Scenic Highway. Because an official designation for this portion of SR 4 has not been pursued, development within the Specific Plan Area would not be precluded.

INTRODUCTION

The City of Brentwood Priority Area 1 Specific Plan (PA-1 Specific Plan, or Specific Plan) will identify the community's vision for the future growth, development, and conservation of open space and resources within the Specific Plan Area in a manner consistent with the guidance and direction provided by the Brentwood General Plan, in order to achieve the quality of life desired by residents and businesses.

This City of Brentwood Priority Area 1 Specific Plan Existing Conditions Report provides an overview of the Plan Area and the greater Brentwood area's physical, environmental, economic, and demographic setting, as of early 2017.

City of Brentwood staff, the Priority Area 1 Specific Plan consultant (De Novo Planning Group), and its subconsultants have worked together to ensure that this is an accurate and reliable source of information. This document is intended to serve as a comprehensive reference for community members, policymakers, staff, the City's Specific Plan Working Group, and the consultant team throughout the Specific Plan preparation process.

The Priority Area 1 Specific Plan process will include a detailed land use plan, which sets a vision for the future of the Specific Plan Area, and an Environmental Impact Report (EIR), which investigates the possible impacts of the Priority Area 1 Specific Plan to the surrounding physical environment. This Existing Conditions Report document provides information about these components and establishes the existing setting for the EIR.

This chapter provides a brief background summary of the city of Brentwood, summarizes the contents of this Existing Conditions Report, and provides an overview of the Priority Area 1 Specific Plan.

BACKGROUND

The City of Brentwood, incorporated in 1948, was among the fastest growing cities in California during the early and mid-2000's, and encompasses 14.8 square miles in eastern Contra Costa County on the rim of the San Francisco Bay Area. The city has a strong agricultural heritage, but has become more urbanized with the rapid population growth of the last several years. Brentwood is primarily a residential community due to its historically affordable housing supply and has an estimated population of 58,784 as of January 1, 2016. Concurrent with the housing boom of the early and mid-2000's, the city experienced a substantial increase in retail and service uses, as well as moderate growth in the light industrial sector. Despite these increases, the city is still a popular community for commuters. Additionally, the Contra Costa County agricultural core is situated to the south and east of the community, and supports an agri-tourism industry, which has long been popular with residents from across the region.

In July 2014, the City of Brentwood completed and adopted a comprehensive update to the General Plan. The 2014 Brentwood General Plan is the overarching policy document that guides land use, housing, transportation, infrastructure, community services, and other policy decisions throughout Brentwood. The Land Use Element of the 2014 General Plan establishes one Priority Area within the city, Priority Area 1. A Priority Area is an overlay designation that identifies an area of the city that warrants particular attention with respect to the land use mix, jobs/housing balance, and overall design and integration of future development projects. In addition to the parcel-specific land use designations assigned to all parcels within a Priority Area, a Priority Area overlay designation establishes a set of overarching guidance policies that shall be used by the City to ensure quality and integrated

development that assists in meeting the economic development goals of the General Plan. Development within a Priority Area shall be consistent with the underlying land use designations.

As discussed in greater detail in Section 1.0, Land Use and Socioeconomics, General Plan Policy LU 1-2 provides specific guidance regarding the planning and development goals for Priority Area 1. In order to ensure that the General Plan guidance with respect to Priority Area 1 is implemented and carried out, the City has elected to prepare a specific plan to establish a detailed land use, infrastructure, and development plan for Priority Area 1.

In the spring of 2016, the City issued a request for proposals (RFP) inviting bids from qualified consulting firms to assist the City in the preparation of the Priority Area 1 Specific Plan. This Existing Conditions Report represents a key initial step in the process of creating the Priority Area 1 Specific Plan.

EXISTING CONDITIONS REPORT CONTENTS

To prepare a meaningful Specific Plan, existing conditions within the Plan Area must be understood and documented. The Existing Conditions Report identifies development patterns, natural resources, socioeconomic conditions, and environmental constraints in the Specific Plan Area and identifies the regulatory environment for each topic. This report will be a resource for the City Council, Planning Commission, Priority Area 1 Specific Plan Working Group, City staff, and the De Novo Planning Group team for the Priority Area 1 Specific Plan and EIR. The Existing Conditions Report makes extensive use of maps, graphics, and user-friendly non-technical terms to help make it accessible to the general public.

The Existing Conditions Report provides background data and will serve as a technical framework, while the Priority Area 1 Specific Plan will focus on goals, policies, and implementation programs. The information collected for the Existing Conditions Report will also be used as the basis for the “existing setting” sections of the Priority Area 1 Specific Plan EIR.

The following topic areas are addressed in the Existing Conditions Report:

1.0 LAND USE AND SOCIOECONOMICS

The Land Use and Socioeconomics chapter addresses land use and demographics, including issues related to land use patterns, community character, and economic development. The information in this chapter will provide both a historical and current perspective on land use and is intended to assist the Specific Plan process by providing both historical context and a baseline of existing land use information to be used when formulating alternate growth and land use scenarios for the Specific Plan Area.

The economic development discussion provides an overview of Brentwood’s economy to be used as a resource in the development of the Priority Area 1 Specific Plan. Priority Area 1 represents an important component of the city of Brentwood’s land available for future development under the City’s General Plan. It is important because of its position at a key location along State Route 4, and because it represents a significant portion of the city’s overall developable land supply. The discussion contained in the Land Use and Socioeconomics chapter explores the role of Priority Area 1 in addressing the city’s long-term needs for land that can support residential and non-residential development.

This chapter also contains information about existing fiscal conditions in the city of Brentwood, including operating revenue sources and operating expenditures. Additionally, this chapter focuses on the revenues and expenditures that comprise the City’s General Fund. The General Fund is the part of the overall City budget that receives the City’s most important discretionary revenues, and funds critical

public services such as law enforcement, parks and community services that the City will need to extend to the Specific Plan Area as new development occurs.

2.0 CIRCULATION

The Circulation chapter describes the circulation network serving the Specific Plan Area. Existing conditions are described for roadway operations, pedestrian-bicycle facilities, transit service, and multimodal operations. This chapter includes a review of relevant transportation planning documents describing the Brentwood area including the current General Plan Circulation Element, Brentwood's current Capital Improvement Program, the Metropolitan Transportation Commission (MTC) *Transportation 2035*, the MTC Regional Transportation Improvement Program, the Contra Costa County Congestion Management Program, Plan Bay Area, Contra Costa Transportation Authority's (CCTA) *Growth Management Program Implementation Guide*, and the *East County Action Plan for Routes of Regional Significance*. Federal, State, regional, and local regulations pertaining to traffic and circulation in Brentwood are also described.

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

The Utilities, Community Services, and Facilities chapter describes the existing conditions and regulatory context regarding community services, including water, wastewater, education, public safety services, and parks and recreational resources within the city and the Specific Plan Area. These facilities and services provide a framework that supports growth and development in the Specific Plan Area. This chapter describes existing service levels, available resources, planned expansion of services and infrastructure, and will identify any known issues or constraints associated with the provision of services.

4.0 HAZARDS, SAFETY, AND NOISE

The Hazards, Safety, and Noise chapter provides a summary of existing setting and conditions associated with natural and man-made hazards that may pose a danger to city residents, employees and visitors including: dangers from hazardous materials including hazardous materials sites (i.e., landfills, superfund sites, pipelines and sites with the potential for chemical explosion); fire hazards; emergency response; aircraft hazards; and major inclement weather conditions. Known hazardous conditions listed in available state and County databases are described, and emergency response and evacuation plans are identified. This chapter also includes descriptions of the characteristics of sound and noise and a description of transportation, stationary, and construction noise sources within the Specific Plan Area. A description of the noise monitoring survey results, tabularized noise exposure contours, and an existing conditions noise contour map that reflects traffic and stationary noise sources are included.

5.0 CONSERVATION

The Conservation chapter discusses conservation issues related to cultural and historic preservation, biological resources, air quality, greenhouse gases, geologic and mineral resources, hydrology and water quality, and aesthetics and visual resources in and around the Specific Plan Area. This chapter also discusses open space as it relates to the preservation of natural resources as part of the biological resources discussion, open space associated with managed production of surface water and groundwater resources as part of the hydrology discussion, and open space associated with public health related to geologic and hydrologic hazards as part of the geologic resources and hydrology discussions, respectively. Federal, State, and local regulations that pertain to each of these topics are also described.

USING THE PRIORITY AREA 1 SPECIFIC PLAN

A Priority Area is an overlay designation that identifies an area of the city that warrants particular attention with respect to the land use mix, jobs/housing balance, and overall design and integration of future development projects. In addition to the parcel-specific land use designations assigned to all parcels within a Priority Area, a Priority Area overlay designation establishes a set of overarching guidance policies that shall be used by the City to ensure quality and integrated development that assists in meeting the economic development goals of this General Plan. Development within a Priority Area shall be consistent with the underlying land use designations. Priority Area 1 is identified in the City's General Plan.

The Priority Area 1 Specific Plan will clarify the General Plan's vision and long-range objectives for the specific area identified on the General Plan Land Use Map as Priority Area 1. The Specific Plan will also establish a policy framework, land use entitlements, and specific zoning regulations that will detail the City's plan for projected growth and development and allow both the City and the public to sustain the defining qualities inherent to Brentwood.

1.0 LAND USE AND SOCIOECONOMICS

This chapter examines the land use and development patterns in the city of Brentwood and within the vicinity of the Specific Plan Area, as well as the city’s demographics and housing profile, economic characteristics, and fiscal conditions. The information in this chapter is intended to provide both a historical and current perspective on land use and is intended to assist the Specific Plan process by providing both historical context and a baseline of existing land use information to be used when formulating alternate growth and land use scenarios for the Specific Plan Area. This chapter includes the following sections:

- 1.1 Land Use
- 1.2 Population and Housing
- 1.3 Economic Development and Fiscal Conditions

1.1 LAND USE

This section identifies existing land use patterns in the Specific Plan Area and surrounding area, including community centers, types of residential and commercial development, industrial uses, and a detailed description of agricultural resources, including crops and related commercial endeavors. The regulatory framework associated with land use is identified. Existing land use conditions, including land uses by General Plan designation and assessed land uses, are described. Recent development trends and planning decisions, including pending and approved projects, are also described.

KEY TERMS

City Limits: The city limits includes the area within the City’s corporate boundary, over which the City exercises land use authority and provides public services.

Sphere of Influence: A Sphere of Influence (SOI) is the probable physical boundary and service area of a local agency, as adopted by a Local Agency Formation Commission (LAFCO). An SOI includes both incorporated and unincorporated areas within which a city or special district will have primary responsibility for the provision of public facilities and services.

Specific Plan Area: The Specific Plan Area is defined as the approximately 431.27-acre area in the northwestern portion of the City’s SOI designated as Priority Area 1.

Figure 1.1-1 shows the Brentwood City Limits, the adopted SOI, and the Specific Plan Area.

REGULATORY FRAMEWORK

The regulatory framework discussion describes laws and regulations that guide land use decisions. Adopted plans that pertain to the City are also described.

STATE

California Specific Plan Law

Article 8, Specific Plan [65450-65457] of the Government Code contains the following provisions for the use of Specific Plan documents for local planning purposes:

1.0 LAND USE AND SOCIOECONOMICS

65450. After the legislative body has adopted a general plan, the planning agency may, or if so directed by the legislative body, shall, prepare specific plans for the systematic implementation of the general plan for all or part of the area covered by the general plan.

65451. (a) A specific plan shall include a text and a diagram or diagrams which specify all of the following in detail:

(1) The distribution, location, and extent of the uses of land, including open space, within the area covered by the plan.

(2) The proposed distribution, location, and extent and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses described in the plan.

(3) Standards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable.

(4) A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out paragraphs (1), (2), and (3).

(b) The specific plan shall include a statement of the relationship of the specific plan to the general plan.

65452. The specific plan may address any other subjects which in the judgment of the planning agency are necessary or desirable for implementation of the general plan.

65453. (a) A specific plan shall be prepared, adopted, and amended in the same manner as a general plan, except that a specific plan may be adopted by resolution or by ordinance and may be amended as often as deemed necessary by the legislative body.

(b) A specific plan may be repealed in the same manner as it is required to be amended.

65454. No specific plan may be adopted or amended unless the proposed plan or amendment is consistent with the general plan.

65455. No local public works project may be approved, no tentative map or parcel map for which a tentative map was not required may be approved, and no zoning ordinance may be adopted or amended within an area covered by a specific plan unless it is consistent with the adopted specific plan.

65456. (a) The legislative body, after adopting a specific plan, may impose a specific plan fee upon persons seeking governmental approvals which are required to be consistent with the specific plan. The fees shall be established so that, in the aggregate, they defray but as estimated do not exceed, the cost of preparation, adoption, and administration of the specific plan, including costs incurred pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code. As nearly as can be estimated, the fee charged shall be a prorated amount in accordance with the applicant's relative benefit derived from the specific plan. It is the intent of the Legislature in providing for such fees to charge persons who benefit from specific plans for the costs of developing those specific plans which result in savings to them by reducing the cost of documenting environmental consequences and advocating changed land uses which may be authorized pursuant to the specific plan.

(b) Notwithstanding Section 66016, a city or county may require a person who requests adoption, amendment, or repeal of a specific plan to deposit with the planning agency an amount equal to the estimated cost of preparing the plan, amendment, or repeal prior to its preparation by the planning agency.

(c) Copies of the documents adopting or amending the specific plan, including the diagrams and text, shall be made available to local agencies, and shall be made available to the general public as follows:

(1) Within one working day following the date of adoption, the clerk of the legislative body shall make the documents adopting or amending the plan, including the diagrams and text, available to the public for inspection.

(2) Within two working days after receipt of a request for a copy of the documents adopting or amending the plan, including the diagrams and text, accompanied by payment for the reasonable cost of copying, the clerk shall furnish the requested copy to the person making the request.

(d) A city or county may charge a fee for a copy of a specific plan or amendments to a specific plan in an amount that is reasonably related to the cost of providing that document.

65457.(a) Any residential development project, including any subdivision, or any zoning change that is undertaken to implement and is consistent with a specific plan for which an environmental impact report has been certified after January 1, 1980, is exempt from the requirements of Division 13 (commencing with Section 21000) of the Public Resources Code. However, if after adoption of the specific plan, an event as specified in Section 21166 of the Public Resources Code occurs, the exemption provided by this subdivision does not apply unless and until a supplemental environmental impact report for the specific plan is prepared and certified in accordance with the provisions of Division 13 (commencing with Section 21000) of the Public Resources Code. After a supplemental environmental impact report is certified, the exemption specified in this subdivision applies to projects undertaken pursuant to the specific plan.

(b) An action or proceeding alleging that a public agency has approved a project pursuant to a specific plan without having previously certified a supplemental environmental impact report for the specific plan, where required by subdivision (a), shall be commenced within 30 days of the public agency's decision to carry out or approve the project.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was developed to protect the quality of the environment and the health and safety of persons from adverse environmental effects. Discretionary projects are required to be reviewed consistent with the requirements of CEQA to determine if there is potential for the project to cause a significant adverse effect on the environment. Depending on the type of project and its potential effects, technical traffic, noise, air quality, biological resources, and geotechnical reports may be needed. If potential adverse effects can be mitigated, a mitigated negative declaration is required. If potentially adverse effects cannot be mitigated, an environmental impact report is required. These documents have mandated content requirements and public review times. Preparation of CEQA documents can be costly and, despite maximum time limits set forth in the Public Resources Code, can extend the processing time of a project by a year or longer.

LOCAL AND REGIONAL

City of Brentwood General Plan

The City's current General Plan was adopted July 22, 2014. Land uses in Brentwood have been developed based on the Land Use Map, goals, and policies established by the City's General Plan. The goals most related to the topic of land use include:

Land Use Element

GOAL LU-1: Establish a land use pattern in Brentwood that provides for a diverse, self-sufficient community that offers a broad spectrum of job opportunities, housing types, community facilities, and commercial services.

GOAL LU-2: Establish and maintain residential neighborhoods as safe and attractive places to live with convenient access to commercial services, recreational facilities, employment opportunities, public services, and other destinations.

GOAL LU-3: Provide for 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.

GOAL LU-4: Maintain a high quality natural environment and recreational opportunities in and around Brentwood.

GOAL LU-5: Preserve Brentwood's agricultural heritage by protecting and maintaining significant areas of agricultural lands around the city.

GOAL LU-6: Maintain and enhance the visual quality of Brentwood by promoting the highest standards of architecture and site design for all development projects, both public and private.

Growth Management Element

GOAL GM-2: Maintain a balanced land use plan and a diversified, stable, and self-sustaining revenue base in order to generate the resources necessary to sustain essential and desired City services.

Economic Development Element

GOAL ED-1: Establish and maintain a healthy, balanced approach to economic development that encourages a diversity of businesses which provide employment, services, and goods.

GOAL ED-2: Attract economic growth across a broad spectrum that includes industries well-suited to Brentwood's workforce, location, and other attributes.

GOAL ED-3: Encourage the retention and expansion of the city's existing businesses and encourage start-up and home-based businesses by Brentwood residents.

These guiding goals are reinforced by the City's General Plan Land Use Map through the designation of commercial, mixed use, and office uses along primary transportation corridors; residential development that is proximate to existing and/or planned services, parkland, and other amenities; permanent open space and agricultural conservation areas that buffer the community and limit the extent of growth; the Downtown Specific Plan to ensure that the small-town character of the City's downtown area is maintained; and specific plan and urban reserve areas to guide future growth.

Specific priorities for the future development of Priority Area 1 are identified under General Plan Policy LU 1-2. Specifically:

Priority Area (PA) - A Priority Area is an overlay designation that identifies an area of the City that warrants particular attention with respect to the land use mix, jobs/housing balance, and overall design and integration of future development projects. In addition to the parcel-specific land use designations assigned to all parcels within a Priority Area, a Priority Area overlay designation establishes a set of overarching guidance policies that shall be used by the City to ensure quality and integrated development that assists in meeting the economic development goals of this General Plan. Development within a Priority Area shall be consistent with the underlying land use designations. One Priority Area is identified in this General Plan.

PA-1 - PA-1 is located in the northwest corner of the City, south of Lone Tree Way, west of Shady Willow Lane, generally north of Sand Creek, and east of Heidorn Ranch Road. PA-1 is located within the Brentwood City limits. State Route 4 traverses PA-1 from north to south and bisects the area nearly in half. PA-1 is depicted as an overlay on the Land Use Map. The policy guidance for PA-1 includes the following framework:

1. PA-1 shall be predominantly developed with a mixture of uses that generate jobs, including but not limited to regional commercial, general commercial, professional office, business park, and light industrial. Approximately 80% of the net developable acreage of lands within PA-1 that are designated Mixed Use Pedestrian Transit should be dedicated for these types of uses.
2. The State Route 4 interchange at Lone Tree Way should be utilized to provide an optimal mix of jobs-generating uses.
3. Lands within PA-1 adjacent and in close proximity to SR 4 and the SR 4 interchange shall be reserved exclusively for jobs-generating and commercial uses. Residential uses may be allowed adjacent to and in close proximity to SR 4 if such residential uses are directly incorporated into commercial and/or business park development projects as vertical mixed-use residences (i.e., residential over retail or office space).
4. Land use plans for this area should contemplate a future transit facility that could accommodate a future eBART station and/or park-and-ride facility, but the land use plan should be valid and beneficial to the City and the area if an eBART station does not materialize.
5. Opportunities for mixed-use buildings, including flex live/work space, transit-oriented development, and emerging business flex space should be provided.
6. Exclusive residential uses within PA-1 should not exceed 20% of the net developable acreage of all MUPT parcels within the PA.
7. Commercial, office, and business park projects within PA-1 are encouraged to include and incorporate vertical mixed residential uses. Commercial, office, and business park projects that incorporate residential uses on the second and third stories shall not be counted towards the 20% maximum residential allocation on MUPT parcels within PA-1.

1.0 LAND USE AND SOCIOECONOMICS

8. Encourage a mix of land uses, including jobs-generating uses and residential uses, to be distributed throughout PA-1, and discourage large concentrations of residential-only uses.
9. The development of a large-scale (i.e., 30-60 acre) regional commercial development within PA-1 is strongly encouraged, and should be considered as development applications within PA-1 are received and processed.
10. Residential uses within PA-1 should be designed to complement the predominant jobs-generating and commercial land uses, and should occur at the medium, high, and very high density levels. Densities should generally increase and transition from the medium density range in the south to the higher-density ranges in the northern area of PA-1.
11. Increases in residential densities within PA-1 may be granted by the City if the developer or project applicant provides the City with significant infrastructure improvements or other concessions that provide a community benefit (i.e., school sites, park lands in excess of minimum requirements, or utility infrastructure that exceeds the demand of the proposed project).
12. Residential density bonuses may be granted if commercial and/or office/business park uses are provided on-site within a residential development project.
13. Planning for this PA shall include areas of open space, green space connectivity, optimization and protection of creek corridors, an integrated network of trails and open space connections, and appropriate trails and circulation connectivity with areas surrounding the PA. Residential development that results in isolated or stand-alone neighborhoods from the rest of PA-1 or surrounding Brentwood neighborhoods shall be discouraged.
14. Planning for future development within PA-1 should include a collaborative effort between the City and property owners within PA-1 in order to craft a future development plan that provides for a balanced mix of land uses, infrastructure, and public open space within PA-1.

A brief description of all of the adopted Brentwood General Plan land use designations within the Plan Area are provided below. These descriptions are based on the text of the Brentwood General Plan Land Use Element, Policy LU 1-2, as updated in 2014.

Residential Very High Density (R-VHD) - The R-VHD designation provides for multi-family development and is primarily intended for apartments and/or condominiums in mixed-use areas or areas that are in close proximity to services and facilities that serve very high density uses. This designation accommodates structures of two to three stories or greater, with off-street parking and other requirements suitable for pedestrian-oriented, work-live, and/or mixed-use neighborhoods. The level of amenities, the project location, and the unit types will affect the actual density achieved. The permitted density range is 20.1 to 30.0 units per gross acre (there is no applicable mid-range density for this designation).

Regional Commercial (RC) - The RC designation includes large-scale retail stores and service uses to serve the general needs of the community and the region, primarily along the State Route 4 corridor on large development sites. This designation is intended for businesses that serve the needs of Brentwood residents as well as neighboring communities. Mixed uses allow for the

development of large offices as a secondary use. Examples of uses include bulk retailers, large department stores, supermarkets, hardware stores, and offices.

Mixed Use Pedestrian Transit (MUPT) - The MUPT designation identifies an area which, because of its strategic location, access, and visibility to SR 4, shall be developed predominately with jobs-generating and commercial uses. This designation is intended to provide high-quality jobs in office, professional, research and technology, and light industry sectors, and to allow commercial uses with a regional focus. This area is envisioned to be served by mass transit (i.e., eBART) or located at or near a destination point with a regular bus route. Other uses may include integrated medium to very high density residential development and amenities, including services, restaurants, and recreation opportunities, in a pedestrian-friendly environment. Multi-family housing units will be allowed at a density of 5.1 to 30.0 units per acre, in accordance with the policy direction provided by Priority Area 1 (there is no applicable mid-range density for this designation).

Planned Development (PD) - The PD designation identifies areas where a master planned project has been approved and entitled, and site specific zoning has been established. The PD land use designation defaults to the zoning that is in place for the subject parcel.

Public Facility (PF) - The PF designation applies to land areas reserved for government offices and facilities, public agency offices and facilities, and public utility facilities.

Semi-Public Facility (SPF) - The SPF designation applies to land areas reserved for privately owned uses that serve the community. These uses include religious assembly facilities, golf courses and other privately owned recreation facilities, private schools, and day care centers.

Park (P) - The P designation includes existing and future park and recreation facilities of varying size, function, and location to serve the entire community. Standards for park sites are described in greater detail in the Community Services and Facilities Element. The Land Use Map does not reflect all potential future park sites. Parks are an allowed land use in all residential, commercial, business park, mixed-use, and public and semi-public facility designations.

City of Brentwood Zoning Ordinance

Title 17 of the Brentwood Municipal Code is the City's Zoning Ordinance. The Zoning Ordinance carries out the policies of the General Plan by classifying and regulating the uses of land and structures within the city, consistent with the General Plan. The Zoning Ordinance is adopted to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the city. More specifically, the purpose of the Zoning Ordinance is to achieve the following objectives:

- A. To promote the achievement of the goals and policies of the Brentwood community development plan and all other more specific City plans and policies elaborated in the context thereof;
- B. To advance Brentwood's position as a regional center of commerce, culture, recreation and residential living;
- C. To protect each area and neighborhood of the community from the intrusion of incompatible uses and to provide opportunities for establishments to concentrate for efficient operation in a mutually beneficial relationship to each other and to share services;

1.0 LAND USE AND SOCIOECONOMICS

- D. To foster the development of high-quality neighborhoods in a variety of dwelling types and at a wide range of population densities, with full residential amenities and provision for sunlight, fresh air and usable open space;
- E. To stabilize expectations regarding future development of Brentwood, thereby providing a basis for wise decisions with respect to such development;
- F. To promote the safe, fast and efficient movement of people and goods, and the provision of adequate off-street parking facilities;
- G. To promote the growth and productivity of the Brentwood economy;
- H. To achieve excellence and originality of design in all future developments and to preserve the natural beauty of Brentwood's setting in the east county region; and
- I. To secure equity among individuals in the utilization of their property.

Article II of the Zoning Ordinance includes the City's Zoning Map and provides direction for the interpretation of the Zoning Map. Articles III through VIII define allowable land uses within each zoning district, provide development standards for each zoning district and, where applicable, provide performance standards and identify design criteria. Articles IX and X establish supplementary regulations, include those for landscaping, signage, mobile home parks, affordable housing, agricultural preservation, and large retail uses. Article XI establishes administrative procedure and permit requirements, including design and site development review criteria.

Commercial & Industrial Design Guidelines

The Commercial and Industrial Design Guidelines apply to any nonresidential use and/or building in the City. The Guidelines are intended to accomplish the following:

- Insure that new development relates to good examples of nearby structures;
- Provide visual continuity along street frontages;
- Establish a high level of design quality;
- Maintain a building scale which is consistent with the City's small town, rural heritage;
- Encourage corporate and franchise design to adapt to the unique character of their sites and the City;
- Encourage commercial development to be constructed in patterns which are more pedestrian friendly;
- Reinforce the historic qualities of Downtown Brentwood;
- Convey the City's design expectations to property owners and developers;
- Protect property owner investments by discouraging inappropriate adjacent development; and
- Streamline the development review process by more clearly communicating community expectations to property owners and developers.

The Commercial and Industrial Design Guidelines identify a specific set of criteria for site planning, building design, and signage, as well as for neighborhood commercial uses. In recognition of the distinct characteristics of the Downtown core, Downtown transition zone, and Highway 4 Delta Expressway (State Route 4), a separate set of criteria for site planning, building design, and signage is included for each of these areas.

Residential Design Guidelines

The Residential Design Guidelines apply to new residential subdivision housing, new housing units on individual parcels, residential infill projects in established neighborhoods, additions and exterior renovations to existing residences, and accessory buildings on residential parcels. The Guidelines are intended to accomplish the following:

- Ensure that new development reinforces and supports the scale and character of Brentwood’s existing residential neighborhoods;
- Provide guidance to property owners, developers, and their design professionals in planning and designing new subdivisions and individual new homes as well as additions and renovations to existing homes;
- Establish a clear statement of community expectations in order to provide a greater degree of predictability and certainty about design expectations during project review;
- Provide a high level of design quality;
- Encourage a diversity of neighborhood living spaces and residential design;
- Provide a high quality of design in residential areas regardless of density;
- Ensure sensitive transitions between residential areas of differing densities;
- Provide guidance for future home additions and renovations within established neighborhoods; and
- Integrate new infill development into Brentwood’s established neighborhoods.

The Residential Design Guidelines establish six basic design principles which provide direction in the event that the guidelines for a specific residential use do not clearly address a given condition. The Guidelines establish criteria specific to eight categories of residential uses: subdivisions, small lot detached single family, duets through fourplexes, townhomes, rowhouses, multifamily, mixed use, and existing neighborhoods. The Guidelines address site development and design, street layout, landscaping, open space, building design, accessory uses, and parking.

Measure J

Measure J, approved by Contra Costa County voters in November 2004, provides for the continuation of a half-cent transportation sales tax until 2034. The funds generated from the tax will be used for projects and programs as set forth in the voter-approved Expenditure Plan. Measure J requires each jurisdiction in Contra Costa County to comply with all of the following components of its Growth Management Program:

1.0 LAND USE AND SOCIOECONOMICS

- Adopt a Growth Management Element;
- Adopt a Development Mitigation Program;
- Participate in a Cooperative, Multi-Jurisdictional Planning Process to Reduce Cumulative Regional Traffic Impacts of Development;
- Address Housing Options;
- Develop a Five-Year Capital Improvement Program;
- Adopt a Transportation Systems Management Ordinance or Resolution; and
- Adopt an Urban Limit Line. Cities that do not adopt a ULL default to the voter-approved Countywide ULL, adopted under Measure C in 1990.

EXISTING SETTING

The assessed uses within the Specific Plan Area are summarized in Table 1.1-1 and are shown in Figure 1.1-2. As shown in the table, the Specific Plan Area contains 45.76 acres of vacant land, 20.38 acres of residential uses, 304.43 acres of non-residential uses, and 2.22 acres of “non-taxable” parcels. The Specific Plan Area currently contains approximately 692,603 square feet of non-residential uses and 4 residential units. The dominant non-residential uses are shopping centers, churches, and commercial stores.

TABLE 1.1-1: EXISTING USES – PRIORITY AREA 1 SPECIFIC PLAN AREA

USE	NUMBER OF RESIDENTIAL UNITS	NON-RESIDENTIAL SQUARE FOOTAGE	PARCELS	ACREAGE
Vacant	0	0	6	45.76
Residential Vacant Land	0	0	1	5.01
Vacant Land	0	0	5	40.75
Residential	4	-	4	20.38
Single Family Residential	4	-	4	20.38
Non-Residential	-	692,603	45	304.43
Commercial Stores	-	86,809	2	7.17
Service Stations/Car Wash	-	8,059	2	2.90
Shopping Centers	-	439,247	13	50.25
Drive In Restaurants	-	3,202	1	0.54
Rural, Residential Improved	-	1,296	1	5.87
Rural, With or Without Structures	-	0	8	46.05
Urban acreage	-	1,448	2	51.81
Orchard/Vineyard/Row Crop (10-40 ac.)	-	0	2	51.61
Orchard/Vineyard/Row Crop (> 40 ac.)	-	0	1	50.08
Churches	-	152,542	4	21.82
Government Owned	-	0	7	9.72
Taxable Municipal-Owned	-	0	2	6.62
Not Parcels	-	-	2	2.22
Does not have a taxable APN	-	-	2	2.22
TOTAL	4	692,603	55	372.29

NOTE: TOTAL ACREAGE DOES NOT INCLUDE ROADWAY RIGHT-OF-WAY.

SOURCE: CONTRA COSTA COUNTY, 2016; DE NOVO PLANNING GROUP, 2016.

General Plan Land Use Designations within the Plan Area

Table 1.1-2 summarizes the City’s General Plan land use designations for areas within the Specific Plan Area by acreage and parcels. Land use designations on the adopted General Plan Land Use Map are shown on Figure 1.1-1.

TABLE 1.1-2: GENERAL PLAN LAND USES – PRIORITY AREA 1 SPECIFIC PLAN AREA

<i>LAND USE</i>	<i>PARCELS</i>	<i>ACREAGE</i>
Mixed Use Pedestrian Transit (MUPT)	27	255.37
Park (P)	2	3.33
Planned Development (PD)	2	23.07
Public Facility (PF)	1	0.99
Regional Commercial (RC)	20	62.00
Residential-Very High Density (R-VHD)	2	8.98
Semi-Public Facility	3	16.83
No General Plan Designation	2	2.22
TOTAL	59	372.79

NOTE: TOTAL ACREAGE DOES NOT INCLUDE ROADWAY RIGHT-OF-WAY.

SOURCE: CONTRA COSTA COUNTY, 2016; DE NOVO PLANNING GROUP, 2016.

As shown in Table 1.1-2, the majority of the Specific Plan Area is currently designated Mixed Use Pedestrian Transit (MUPT, 255.37 acres). Other land uses within the Specific Plan Area include Regional Commercial (RC, 62.00 acres), Planned Development (PD, 23.07 acres), Residential-Very High Density (R-VHD, 8.98 acres), Semi-Public Facility (SPF, 16.83 acres), and Public Facility (PF, 0.99 acre).

Surrounding Land Uses

The Specific Plan Area is located in the northwestern corner of Brentwood, within the City limits. Adjoining lands to the east of the Specific Plan Area are designated for General Commercial (GC), Residential-High Density (R-HD), Residential-Medium Density (R-MD), Residential-Low Density (R-LD), School (SCH), and Park (P) uses. Adjoining lands to the south of the Specific Plan Area are designated for GC, P, R-LD, SCH, and Permanent Open Space (P-OS) uses.

Figure 1.1-3 shows the nearby land uses within the cities of Oakley and Antioch. The areas to the north, northwest, and west of the Specific Plan Area are located within the city of Antioch. Adjoining lands to the north of the Specific Plan Area are within the East Lone Tree Focus Area. The East Lone Tree Focus Area encompasses approximately 796 acres in the eastern portion of the city of Antioch. The East Lone Tree Focus Area is intended to provide substantial employment and retail opportunities for the city of Antioch. Land use designations within the East Lone Tree Focus Area include Public, Office/Retail, Residential/Open Space, High Density Residential, Regional Commercial, Regional Retail, Regional Retail/Employment-Generating Lands, and Open Space/Public. Land use designations within the East Lone Tree Focus Area which are immediately adjacent north of the Specific Plan Area include High Density Residential, Regional Commercial, and Regional Retail.

Adjoining lands to the west of the Specific Plan Area are designated Medium Density Residential, High Density Residential, and Open Space by the Antioch General Plan. Additionally, land to the west of the Specific Plan Area is within the Sand Creek Focus Area. The Sand Creek Focus Area encompasses approximately 2,712 acres in the southern portion of the City of Antioch. The Sand Creek Focus Area is

intended to function as a large-scale planned community, providing needed housing and employment opportunities for the city of Antioch. Land use designations within the Sand Creek Focus Area include Open Space, Hillside and Estate Residential, Golf Course/Senior Housing/Open Space, Estate and Executive Residential/Open Space, Low Density Residential, Commercial/Open Space, Mixed Use Medical Facility, Multiple Family, School, Business Park, Public/Quasi-Public, and Open Space/Senior Housing. Land use designations within the Sand Creek Focus Area which are immediately adjacent west of the Specific Plan Area include Business Park, Public/Quasi-Public, and Open Space/Senior Housing. The City of Antioch recently approved three separate single-family residential projects in this area, totaling 1,291 units.

Development Trends

Prior to 1976, development in the Brentwood area was primarily centered in and around the Downtown core and along Brentwood Boulevard.

From 1976 to 1989, growth was primarily residential from the Downtown core toward the west. The majority of residential growth occurred in subdivisions that were built in the area generally north of Balfour Road, east of Fairview Avenue, and both north and south of Central Boulevard. Non-residential development occurred directly east of the Downtown as well as developments north of Downtown, generally along Brentwood Boulevard.

From 1990 to 1999, significant amounts of residential growth occurred, with development filling out much of the area generally from O'Hara Avenue to what is now State Route 4, along both sides of Balfour Road, and up to Sand Creek Road. Non-residential growth filled out much of the area directly north of the Downtown, as well as scattered sites along Brentwood Boulevard south of Balfour Road.

From 2000 to 2009, the City's borders expanded significantly and residential development occurred west of SR 4 and filled out areas south of Balfour Road to the southern City boundaries as far as Concord Avenue. Residential development also extended eastward from the Downtown core area to the eastern City limits, but did not fill in the area along Brentwood Boulevard north of the core area. Residential development also extended north of Sand Creek Road to the northern City boundaries, generally between Shady Willow Lane and O'Hara Avenue, with some residential development also occurring east of O'Hara Avenue. During this time period, a range of commercial, industrial, and other non-residential development occurred, including shopping centers adjacent to SR 4, the Sunset Industrial Complex in northeast Brentwood, the John Muir Health Outpatient Center, and various neighborhood commercial centers.

Pending and Approved Projects

Many residential and non-residential development projects within the city of Brentwood are approved and pending. Additionally, several pending projects within the vicinity of the Specific Plan Area are located within the city of Antioch. The pending and approved development projects within the cities of Brentwood and Antioch are summarized in the following section.

CITY OF BRENTWOOD

Table 1.1-3 lists recently approved and pending residential projects and Table 1.1-4 lists recently approved and pending commercial projects in the city of Brentwood. The Amber Meadows residential project is located within the Specific Plan Area. This pending project includes future development of 69 single-family units and 126 multi-family units. The 14.43-acre Amber Meadows project is located at 2455, 2355, and 2255 Amber Lane in the central portion of the Specific Plan Area.

1.0 LAND USE AND SOCIOECONOMICS

TABLE 1.1-3: APPROVED AND PENDING RESIDENTIAL DEVELOPMENT PROJECTS - BRENTWOOD

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS (OF DETACHED UNITS UNLESS OTHERWISE INDICATED)</i>
Palmilla	408 SF units approved on 77.45 acres	154 SF units not yet built 83 SF units under construction 171 SF units occupied
Sciortino Ranch	326 SF units approved on 52.00 acres	326 SF units not yet built
St. Martins Place	8 SF units approved on 4.02 acres	3 SF units not yet built 1 SF unit under construction 4 SF units occupied
Vista Dorado I	82 SF units approved on 43.9 acres	49 SF units not yet built 22 SF units under construction 11 SF units occupied
True Life Companies	96 SF units approved on 18.50 acres	96 SF units not yet built
St. James Tract	8 SF units approved on 3.77 acres	7 SF units not yet built 1 SF unit occupied
Mission Grove	132 SF units approved on 15.60 acres	24 SF units not yet built 34 SF units under construction 74 SF units occupied
Magnolia	33 SF units approved on 3.62 acres	23 SF units not yet built 10 SF attached units not yet built
Catchings Ranch	24 SF units approved on 8.03 acres	24 SF units not yet built
Parkside Villas	37 SF units approved on 10.40 acres	35 SF units not yet built 2 SF attached units not yet built
Fairview Avenue	9 SF units approved on 3.35 acres	9 SF units not yet built
Portofino	240 SF units approved on 112.40 acres	3 SF units not yet built 20 SF units under construction 217 SF units occupied
Bridle Gate	336 SF units pending on 134.00 acres	336 SF units not yet built
Barrington	494 units approved on 59.72 acres	90 SF detached units not yet built 59 SF detached units under construction 337 SF detached units occupied 4 SF attached units not yet built 0 SF attached units under construction 4 SF attached units occupied
Brentwood CC	63 SF units approved on 26.00 acres	63 SF units not yet built
Amberfield II	6 SF units pending on 3 acres	6 SF units not yet built
Villagio	160 SF units approved on 42.30 acres	118 SF units not yet built 33 SF units under construction 9 SF units occupied
Trilogy at the Vineyards	1,600 units approved on 623.27 acres	358 SF detached units not yet built 97 SF detached units under construction 645 SF detached units occupied 150 SF attached units not yet built 350 MF units not yet built
Amber Meadows	195 SF and MF units pending on 14.43 acres	69 SF units not yet built 126 MF units not yet built

1.0 LAND USE AND SOCIOECONOMICS

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS (OF DETACHED UNITS UNLESS OTHERWISE INDICATED)</i>
Orfanos Property	160 SF units pending on 20 acres	160 SF units not yet built
Mission Park	48 SF units approved on 6.07 acres	48 SF units not yet built
Sellers Pointe	84 SF units approved on 16.63 acres	84 SF units not yet built
Sparrows at Marsh Creek	50 SF units approved on 6.7 acres	39 SF units not yet built 11 SF attached units not yet built
Steeplechase	180 SF units approved on 46.67 acres	25 SF units under construction 155 SF units occupied
Bella Fiore	98 SF units approved on 13.5 acres	45 SF units under construction 53 SF units occupied
Lexington Park	167 SF units approved on 55.41 acres	1 SF unit under construction 9 SF units under construction 157 SF units occupied
Alvernaz Partners (TSM 9412)	48 SF units approved on 8.00 acres	48 SF units not yet built
Pioneer Square	72 SF units pending on 10.89 acres	72 SF attached units not yet built
Windy Springs Estates	5 SF units approved on 2.68 acres	4 SF units not yet built 1 SF units occupied
Amberfield	36 SF units approved on 9.84 acres	23 SF units not yet built 13 SF units under construction
Kingston Park	27 SF units approved on 9.10 acres	23 SF units not yet built 4 SF units under construction
Vista Dorado II	50 SF units approved on 16.18 acres	50 SF units not yet built
TOTAL	1,839 SF units occupied; 446 SF units under construction 2,521 SF units not yet built; 476 MF units not yet built	

SOURCE: CITY OF BRENTWOOD, 2017.

TABLE 1.1-4: APPROVED AND PENDING NON-RESIDENTIAL DEVELOPMENT PROJECTS - BRENTWOOD

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS</i>
Cornerstone Church	40,540 s.f. on 6.87 acres	Approved, Permit Not Issued
Delta Fence	25,916 s.f. of industrial uses on 2.50 acres	Approved, Permit Issued
Best Western Motel	28,260 s.f. (45 rooms) on 0.92 acres	Approved, Permit Issued
Garin Commercial	44,300 s.f. of retail and 55,500 s.f. of office uses on 9.89 acres	Approved, Permit Issued
Brentwood Plaza II	7,430 s.f. of retail and 1,301 s.f. of office uses on 1.00 acre	Approved, Permit Not Issued
Lone Tree Plaza	7,985 s.f. of office uses on 0.78 acres	Pending
Elite Self Storage	170, 262 s.f. on 3.99 acres	Approved, Permit Not Issued
Sciortino Ranch	126,000 s.f. of retail uses on 9.00 acres	Approved, Permit Not Issued
The Shops at Fairview	94,000 s.f. of retail uses on 9.60 acres	Approved, Permit Issued
City Block	40,925 s.f. of retail uses and 8,439 s.f. of office uses on 4.47 acres	Approved, Permit Issued
Kendall Plaza	4,400 s.f. of retail, 7,110 s.f. of office, and 17,592 s.f. of industrial uses on 2.0 acres	Approved, Permit Issued
Lone Tree Crossing	117,368 s.f. of retail uses on 9.69 acres	Approved, Permit Issued

1.0 LAND USE AND SOCIOECONOMICS

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS</i>
Streets of Brentwood	460,000 s.f. of retail uses on 53.67 acres	Approved, Permit Issued
Brentwood Library	20,721 s.f. on 0.43 acres	Pending
TOTAL	894,423 s.f. of retail uses approved 72,350 s.f. of office uses approved; 7,985 s.f. of office uses pending 43,508 s.f. of industrial uses approved 229,204 s.f. of other uses approved; 20,721 s.f. of other uses pending	

SOURCE: CITY OF BRENTWOOD, 2016.

CITY OF ANTIOCH

Table 1.1-5 lists recently approved and pending residential projects and Table 1.1-6 lists recently approved and pending non-residential projects in the city of Antioch.

TABLE 1.1-5: APPROVED AND PENDING RESIDENTIAL DEVELOPMENT PROJECTS - ANTIOCH

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS</i>
Almondridge East Tract	81 SF units approved on 21 acres	81 SF units under construction, Final Map approved
Black Diamond Ranch 7487, 8585, 8586	Unit 1: 58 SF units Unit 2: 117 SF units Unit 3: 105 SF units	Unit 1: 58 SF units complete Unit 2: 117 SF units under construction Unit 3: 105 SF units under construction
Black Diamond Ranch Unit 4	10 lots on 20.98 acres	Accepted
Black Diamond Ranch Unit 4	17 lots on 20.98 acres	Preliminary Development Plan Reviewed by Council 11/10/15
Delta Courtyard Apartments	126 MF units on 4.46 acres	Design Review, Use Permit, and Lot Line Adjustment under review
Heidorn Village	117 units on 20.09 acres	Approved
Hidden Glen New Models	17.29 acres	Approved, under construction
Hidden Glen 8388	90 SF units	Approved
Hillcrest at Wildflower	9.583 acres Comm., 8.08 acres MF, 2.24 acres SF on 23.04 acres	Preliminary Development Plan reviewed
Laurel Ranch	Approx. 187 lots on 54 acres	In progress
Meritage New Models at Hidden Glen (Copper Ridge)	191 lots from Arcadia Development	Under construction
Monterra (Nelson Ranch)	130 SF units on 145 acres	Approved
Monterra-Riverview	Design Review on 38.10 acres	Approved
Oakley Knolls	31 units on 5.56 acres	In progress
Olive Groves	263 SF senior housing units, assisted living facility, rec. facility, and comm. uses on 96.5 acres	Accepted
Park Ridge Phase I	Design Review on 29.6 acres	In progress
Park Ridge	525 SF units on 171 acres	Approved, in Plan Check
Aviano Design Review	533 SF units on 184 acres	Accepted
Aviano	533-unit subdivision amendments to approved/entitled project on 189 acres	Approved
The Promenade	641 SF units on 140.37 acres	Approved

1.0 LAND USE AND SOCIOECONOMICS

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS</i>
Quail Cove	32 units on 5.59 acres	In progress
Tabora Gardens	85 affordable senior apartments	Approved
The Ranch	1,188 units on 550.8 acres	Preliminary Development Plan reviewed

SOURCE: CITY OF ANTIOCH, 2016.

TABLE 1.1-6: APPROVED AND PENDING NON-RESIDENTIAL DEVELOPMENT PROJECTS - ANTIOCH

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS</i>
Al Saddiq Community Center	Use Permit for community center on 1.32 acres	Accepted
All Star Rents	Use Permit for equipment rental company on 1.3 acres	Accepted
Antioch Doggie Daycare	Use Permit for dog daycare and boarding facility on 2.1 acres	Accepted
Arco Remodel	Demo and rebuild on 0.87 acres	In progress
Banfield Pet Hospital	Use Permit for veterinary clinic	Accepted
Bedford Center	Use Permit on 0.35 acres	Approved
Bluerock Business Center	122,856 s.f. office/retail	101,256 s.f. built
Buchanan Crossings Shops E	Design Review for multi-tenant retail building on 13.5 acres	Approved
Buchanan Crossings Shopping Center Major D, Pads A & C, Art Feature	102,370 s.f. Center 17,000 s.f. Grocery Outlet 5,500 s.f. multi-tenant 4,400 s.f. restaurant	Complete
Contra Loma Estates	Variance for fencing	Accepted
Deer Valley Business Park Sign Program	Sign program	In progress
Deer Valley Business Park Parcel 1 + Bldgs. N, O, P	16 single user buildings, 1,800-1,700 s.f. on 6 acres	Under construction
Delta Bowl Addition and Remodel	Expansion and modernization, parking variance on 3.337 acres	Accepted
Delta Fair Village	Demo, replace with parking garages and 3-floor residential condos, retail space on 13.5 acres	Accepted
4 Star Auto Repair	Install car bays and metal building on 0.433 acres	Accepted
Gas Station Remodel	Demo, construct 22,500 sf mini mart	Approved
Habit Burger	3,418 s.f. building and patio area on 0.9772 acres	Accepted
Hillcrest Summit	1,500 s.f. retail and 35,077 s.f. office on 5.0 acres	Approved
Holy Cross Cemetery	Use Permit	Accepted
Kaiser Medical Center	500,000 s.f. hospital 450,000 s.f. offices	340,400 s.f. hospital built 313,500 s.f. offices built
Lakeview Medical Office Building	Design Review on 1.3 acres	Under construction
Manufactured Home Sales	Design Review on 0.31 acres	Approved

1.0 LAND USE AND SOCIOECONOMICS

<i>PROJECT NAME</i>	<i>DESCRIPTION</i>	<i>STATUS</i>
Minimart	Remodel 4,205 s.f.	Accepted
Shell Remodel	Design Review on 0.355 acres	In progress
Somersville Town Center Out Parcels	2 pad buildings on 2.43 acres	Approved
Verizon Wireless	Wireless facility on rooftop	Approved
Verizon Wireless	Verizon Communication Facility on 3.0 acres	Approved
Vineyard Self Storage	Storage facility on 6.68 acres	Accepted
Williamson Ranch Daycare	Day care facility on 1.25 acres	Approved

SOURCE: CITY OF ANTIOCH, 2016.

REFERENCES

The primary sources of data referenced for this section are the following:

City of Brentwood, 2016. Brentwood Municipal Code. Current through Ordinance 970 and the July 2016 code supplement.

City of Brentwood, 2012. Brentwood Boulevard Specific Plan. March 27, 2012.

City of Brentwood, 2014. City of Brentwood General Plan. Adopted July 22, 2014.

City of Brentwood, 2001. Commercial and Industrial Design Guidelines. March 13, 2001.

City of Brentwood, 2016. Commercial Project Status Report. July 1, 2016.

City of Brentwood, 2016. Downtown Specific Plan. Prepared by Freedman Tung & Bottomley. Originally adopted November 16, 2005 and most recently updated September 13, 2016.

City of Brentwood, 2006. Residential Design Guidelines. September 26, 2006.

City of Brentwood, 2017. Residential Project Status Report. January 1, 2017.

Contra Costa County, 2000. Contra Costa County Airport Land Use Compatibility Plan. Contra Costa County Airport Land Use Commission. December 13, 2000.

Contra Costa County, 2005. Contra Costa County General Plan. January 18, 2005 (reprint July 2010).

Contra Costa County, 2016. Parcel Data provided by the County Assessor's Office. August 2016.

1.2 POPULATION AND HOUSING

This section summarizes the City’s demographics and housing profile. More detailed information regarding population and housing, including population and household characteristics and a housing needs assessment, is provided in the City’s Housing Element.

REGULATORY FRAMEWORK

The regulatory framework discussion describes laws and regulations that guide land use decisions. Adopted plans that pertain to the City are also described.

STATE

California General Plan Law

Government Code Section 65300 requires that each county and city adopt a General Plan, as described in Section 1.1.

Housing element law (Government Code Sections 65580 through 65589.8) requires local governments to adopt a Housing Element that addresses existing and projected housing needs, including their share of the regional housing need. A Housing Element must include an analysis of existing and projected housing needs, identification of governmental and non-governmental constraints to the provision of housing, an inventory of sites appropriate to accommodate the City’s housing needs, identification of resources available to assist with meeting housing needs, a review of the effectiveness of the previous Housing Element, and a plan to address the identified housing needs and constraints.

LOCAL AND REGIONAL

Regional Housing Needs Plan

California General Plan law requires each city and county to have land zoned to accommodate a fair share of the regional housing need. The share is known as the Regional Housing Needs Allocation (RHNA) and is based on a Regional Housing Needs Plan (RHNP) developed by councils of government. The Association of Bay Area Governments (ABAG) is the lead agency for developing the RHNP for the nine-county area that includes Contra Costa County and the City of Brentwood. Brentwood’s fair share of the adopted RHNA for 2014-2022 is summarized in Table 1.2-1.

The City is not required to ensure that adequate development to accommodate the RHNA occurs; however, the City must facilitate housing production by ensuring that land is available and that unnecessary development constraints have been removed. The City’s Housing Element, adopted in 2015, provides for the accommodation of the 2014-2022 RHNA that has been assigned to the City of Brentwood.

TABLE 1.2-1: REGIONAL HOUSING NEEDS ALLOCATION

VERY LOW INCOME	LOW INCOME	MODERATE INCOME	ABOVE MODERATE INCOME	TOTAL
<i>2014 – 2022</i>				
234	124	123	279	760

SOURCE: ABAG, 2014.

City of Brentwood General Plan

The City's Housing Element, one of the seven mandated General Plan elements, was adopted April 28, 2015. The Housing Element establishes the following four goals related to population and housing:

- *Housing:* Provide a diversity of housing opportunities to enhance the City's living environment and to satisfy the shelter needs of all Brentwood residents.
- *Affordability:* Provide housing that is affordable to all socio-economic segments of Brentwood's population.
- *Equitable Distribution of Affordable Housing:* Achieve and maintain an equitable distribution of housing for all economic groups throughout the community.
- *Housing Opportunities:* Provide equal housing opportunities for all residents of Brentwood.

The Land Use Element identifies six land use categories for residential use: Ranchette Estate, Residential Very Low Density, Residential Low Density, Residential Medium Density, Residential High Density, and Residential Very High Density. The Mixed Use Pedestrian Transit category also allows residential uses. The Land Use Element and land use designations are described in greater detail in Section 1.1, Land Use.

Residential Growth Management Program

The City's Residential Growth Management Program (RGMP), adopted on July 6, 2001, was intended to maintain a planned and sustainable rate of growth in conjunction with the General Plan, synchronizing residential growth with the availability of infrastructure and municipal and public safety services. The RGMP requires projects to apply for a growth management allocation, with exemptions provided for specific types of projects and units.

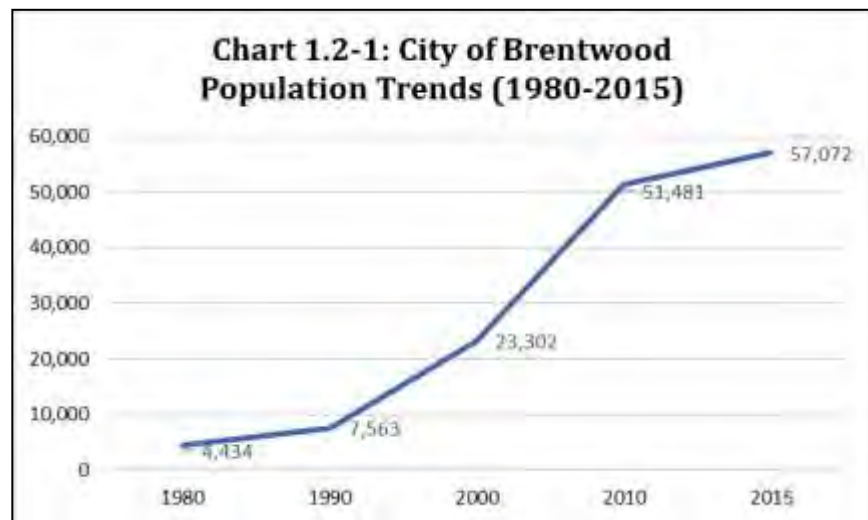
Due to the economic downturn and corresponding decrease in residential development activity, the RGMP was suspended by the City Council on May 10, 2011. Upon completion of the General Plan Update in 2014, an action was included in the Fiscal Sustainability Element to develop and implement the RGMP, and to tie it to jobs-related impacts created by new residential growth. The RGMP remains, however, suspended at this time.

EXISTING SETTING

Population and Households

Historical population growth trends in Brentwood are depicted in Chart 1.2-1. Table 1.2-2 summarizes U.S. Census population and household data for Brentwood and Contra Costa County from 1980 through 2015.

Over the past several decades, Brentwood's population has grown at an impressive rate,



1.0 LAND USE AND SOCIOECONOMICS

making it one of the fastest growing cities in California. Incorporated in 1948 with a population under 1,700, Brentwood's growth rate was generally steady until the 1980s. Throughout the 1980s and 1990s growth fluctuated, reflecting the prevailing economic conditions. Both the national recession and high interest rates in the early 1980s caused a slackening in the population growth rate. From 1980 through 2010, Brentwood's population grew significantly, more than doubling in both the 1991-2000 and 2001-2010 decades.

TABLE 1.2-2: POPULATION AND HOUSEHOLD GROWTH

	1980	1990	2000	2010	2015	1980-2000 CHANGE	2000-2015 CHANGE	AVG. ANNUAL CHANGE
<i>Brentwood</i>								
Population	4,434	7,563	23,302	51,481	57,072	426%	145%	33.9%
Households	1,532	2,475	7,497	16,494	17,138	389%	129%	29.1%
Persons per household	2.88	3.04	3.10	3.11	3.17	8%	2%	0.3%
<i>Contra Costa County</i>								
Population	656,380	803,732	948,816	1,049,025	1,111,143	45%	17%	2.0%
Households	241,418	300,288	344,129	375,364	380,183	43%	10%	1.6%
Persons per household	2.69	2.64	2.72	2.77	2.82	1%	4%	0.1%

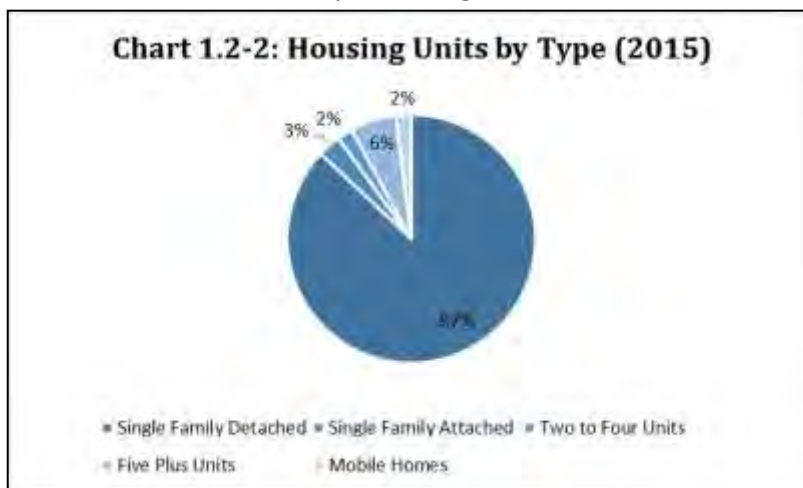
SOURCES: U.S. CENSUS, 2000; U.S. CENSUS, 2010; U.S. CENSUS 2015; CALIFORNIA DEPARTMENT OF FINANCE, 2015.

From 1980 to 2000, the City's population increased by 426% from 4,434 to 23,302 persons. During the 1990s and 2000s, Brentwood experienced rapid population growth increasing by approximately 581% from 7,563 to 51,481 between 1990 and 2010. Between 2000 and 2015, the City's population increased by 145% from 23,302 to 57,072 persons. In contrast, Contra Costa County's total population increased by approximately 31% between 1990 and 2010. Between 1980 and 2015, Brentwood's population growth rate averages to 33.9% per year, while that of Contra Costa County is an average of 2.0% per year. As of July 2015, Brentwood's population was estimated by the U.S. Census Bureau to be 58,968, an increase of 153% from the City's 2000 population of 23,302.

Households have increased at a rate generally proportional to Brentwood's population, with both households and populations increasing by similar percentages from 1980 to 2000 and 2000 to 2015. Over the years, the average household size has increased steadily with a high of 3.17 in 2015 and a low of 2.88 in 1980.

Housing Units

As shown in Table 1.2-3, the number of housing units in Brentwood has increased at rates similar to the population with significant increases since 1990. In 2010, there were 17,523 housing units in the city. From 2000 to 2015, housing units increased from 7,788 to 18,663, a 140% increase. The majority of the housing units in



the city are single-family detached, which account for 87% of housing units. The remaining housing types include single-family attached (3%), duplexes through fourplexes (2%), multi-family apartments with five or more units (6%), and mobile homes (2%). Four single-family residences currently exist within the Specific Plan Area. One pending residential project, the Amber Meadows project, is located within the Specific Plan Area. This pending project includes future development of 69 single-family units and 126 multi-family units.

TABLE 1.2-3: HOUSING UNITS

	1990	2000	2010	2015	1990-2000 CHANGE	2000-2015 CHANGE	AVG. ANNUAL CHANGE
Brentwood	2,628	7,788	17,523	18,663	196%	140%	24.4%
Contra Costa County	316,170	354,577	400,263	407,661	12%	15%	1.2%

SOURCES: U.S. CENSUS, 2000; U.S. CENSUS, 2010; U.S. CENSUS, 2015; DEPARTMENT OF FINANCE, 2015.

In Contra Costa County, housing units have increased at a much slower pace, with a 15% increase from 2000 to 2015. The average annual increase in housing units since 1990 in Brentwood is 24.4%, compared with a 1.2% annual average increase in Contra Costa County.

REFERENCES

ABAG, 2014. *Regional Housing Need Plan for the San Francisco Bay Area: 2014-2022*. July 18, 2013.

California Department of Finance. 2016. Table E-5, Population and Housing Estimates for Cities, Counties, and the State, January 1, 2011-2016, with 2010 Benchmark. Sacramento, California, May 2016.

City of Brentwood, 2011. *Residential Growth Management Program*. May 10, 2011.

U.S. Census Bureau, 2010. 2010 U.S. Census Population, Housing, and Housing Unit Counts.

U.S. Census Bureau, 2000. 2000 U.S. Census Population, Household, and Housing Unit Counts.

1.3 ECONOMIC DEVELOPMENT AND FISCAL CONDITIONS

This section provides an overview of Brentwood’s economy to be used as a resource in the development of the Priority Area 1 Specific Plan. This section contains information about existing fiscal conditions in the city of Brentwood, including operating revenue sources and operating expenditures. This section focuses on the revenues and expenditures that comprise the City’s General Fund. The General Fund is the part of the overall City budget that receives the City’s most important discretionary revenues, and funds critical public services such as law enforcement, parks and community services that the City will need to extend to the Specific Plan Area as new development occurs.

The objective of this section is to provide Priority Area 1 Specific Plan stakeholders, including the public, the consultant team, City staff, and City policymakers with a common understanding of how the City of Brentwood spends its General Fund monies at present, how those monies are generated, and the implications for planning for development in the Specific Plan Area, given a desire to ensure that the City maintains a fiscally sustainable budget as the community grows in this key area.

REGULATORY FRAMEWORK

LOCAL

Operating Budget

The City adopts an Operating Budget for each fiscal year. The Operating Budget is the annual spending plan which serves as the legal authority for City divisions to commit and spend financial resources. Divisional budgets consolidate program activities into similar service categories within a fund with the intent of reducing the cumbersome nature of a program-based budget document. Every effort has been made to present the budget document in a “user-friendly” format with increased emphasis on trends and written explanations.

Fiscal Model

The primary objective of the City of Brentwood Fiscal Model is to construct a ten-year forecast in order to ensure the City has a financially healthy future. The Fiscal Model provides City staff and decision-makers with detailed analysis and projections of the next ten years of revenues, expenses, and fund balance of the General Fund. The Fiscal Model has five interlinked sections:

1. A development model;
2. Expense models for each department and division, summarized at the General Fund level and supported by a staffing and compensation model;
3. An employee compensation model, including variables for cost-of-living increases, health care, costs, retiree medical and pension funding, overtime, and worker’s compensation costs, and the impacts that the various tiered benefit levels and employee turnover will have on these costs. These expenses are further broken down between miscellaneous and public safety employees;
4. A revenue model for each major revenue source; and
5. A fund balance model.

The Fiscal Model is updated and adopted annually by the City Council.

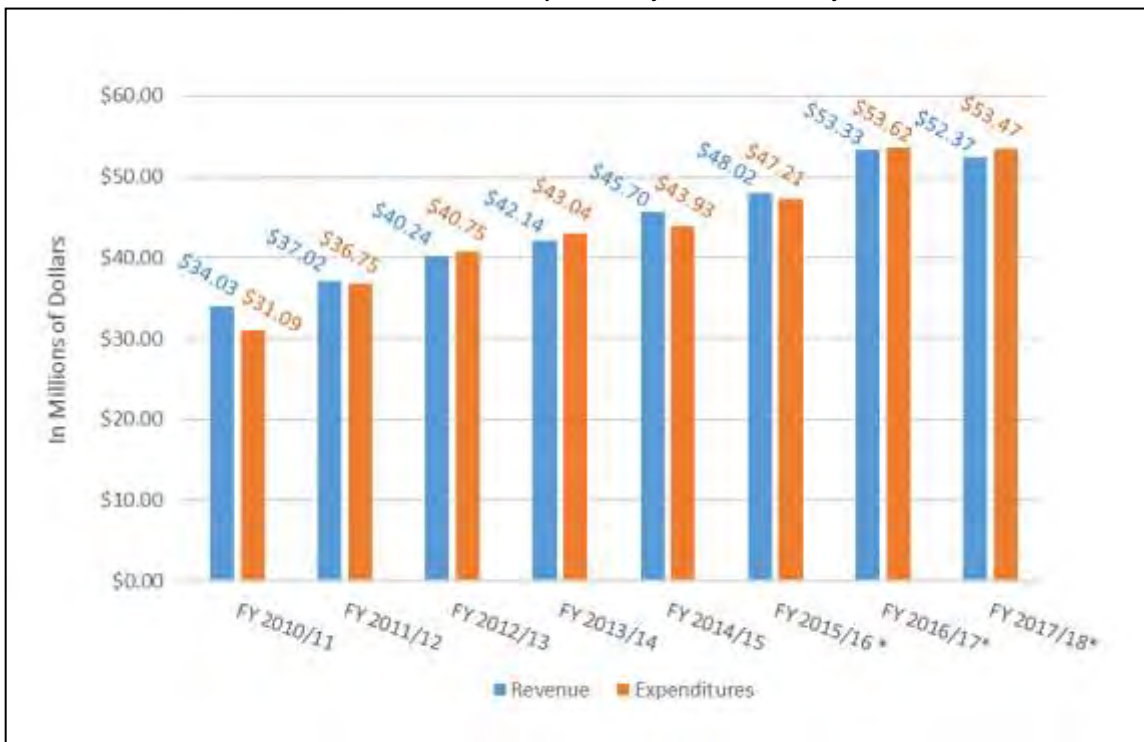
Comprehensive Economic Development Strategy

In 2011, the City Council adopted a Comprehensive Economic Development Strategy that includes three primary components: a vision that is based on Brentwood’s position in the regional marketplace; key industries that should be targeted for business attraction; and key initiatives. Industry clusters targeted for business attraction include health care, medical device manufacturing, green industries, agricultural enterprises, retail, professional and business services, educational services, and machinery and short-run manufacturing. Strategic initiatives focus on marketing, public information, business retention, and office, industrial, and retail development.

EXISTING FISCAL CONDITIONS

The General Fund is the primary operating fund for the City of Brentwood. The General Fund pays for many of the critical services offered to the city’s residents, including police, street maintenance, and parks and recreation. The majority of revenues used to provide services to the public are derived from sources which are extremely susceptible to economic changes; however, due to an upturn in the housing market since the end of the recession, and increasing property valuation and development activity, the City of Brentwood’s General Fund experienced modest positive impacts in recent years. As shown in Chart 1.3-1, total General Fund revenue trended upward between FY 2010/11 and FY 2014/15, increasing 34.3 percent. Budgeted revenues are expected to continue the upward trend. In FY 2016/17, General Fund revenue is budgeted to reach a seven-year high of \$53.33 million, representing an 11.0 percent increase over the prior fiscal year, and is expected to remain steady through FY 2017/18. General Fund expenditures also trended upward, increasing 41.0 percent between FY 2010/11 and FY 2014/15. Budgeted expenditures are expected to reach a seven-year high of \$53.62 million in FY 2016/17, representing a 13.6 percent year-over-year increase, and are also expected to remain steady through FY 2017/18.

CHART 1.3-1: TOTAL GENERAL FUND EXPENDITURES, FY 2010/2011- FY 2017/2018



SOURCE: BAE, 2016.

Despite the General Fund's growth, the City faces major challenges, including funding shortfalls: increasing costs for public safety; remittances to Contra Costa County resulting from the dissolution of Redevelopment Agencies; and rising employee benefit costs. Each trend is discussed briefly below and in more detail in the revenues and expenditures section of this chapter.

Increasing Public Safety Costs

For more than 20 years, the City of Brentwood contracted police dispatch services with the City of Antioch; however, due to population growth and increasing concerns regarding service levels, the City Council approved the construction of the Brentwood Police Dispatch Center in 2014. The Dispatch Center became fully operational on March 15, 2017. The Dispatch Center is anticipated to require an annual General Fund appropriation of approximately \$2.7 million.

Additionally, the East Contra Costa Fire Protection District (ECCFPD) provides fire protection to the city of Brentwood. However, the ECCFPD does not have enough revenue to provide adequate service levels to the communities it serves. To address inadequate service levels, the cities of Oakley and Brentwood formed a Fire Task Force and entered into an agreement whereby, between June 2015 and June 2017, each agency contributes funds to the ECCFPD, with the City of Brentwood committing \$666,600. It is unclear whether the City of Brentwood will contribute additional funds as part of the long-term financial sustainability strategy.

Rising Employee Benefit Costs

Personnel costs comprise approximately two-thirds of the General Fund Budget, therefore, labor negotiations and the cost of providing negotiated benefits, such as health care, and retiree medical and pension benefits, can have significant impacts on the City's finances. The City's labor contracts with its bargaining groups expire at the end of FY 2016/17. The FY 2016/17 budget accounts for a 3.0 percent salary increase for non-sworn labor groups and a 2.5 percent salary increase for sworn labor groups, while the FY 2017/18 budget assumes a 2.0 percent salary increase for both labor groups. It is noted that actual cost increases will depend on future labor negotiations.

One of the benefits offered by the City to its employees is participation in the California Public Employees' Retirement System (CalPERS) pension program. The City pays a percentage of each employee's salary to CalPERS, which then invests these funds and ultimately uses them to fund pension obligations. CalPERS sets their rates to ensure adequate funds are available to provide benefits to retirees. With substantial declines in the stock market during the recession, CalPERS has been forced to recover their lost funds through rate increases. The City's pension plans are currently funded at around 80 percent; however, contribution rates are expected to increase. The City paid \$4.6 million towards pension costs in FY 2014/15 and \$5.2 million in FY 2016/16, representing a 13.0 percent year-over-year increase. Pension costs are budgeted to increase to \$6.3 million by 2017/18, representing a 21.1 percent increase over the previous fiscal year, and are anticipated to escalate even further by FY 2024/25.

Another factor which impacts the budget is the culmination of the City's plan to increase funding for post-employment retiree medical benefits by switching from a pay-as-you-go plan to a prefunding plan, where 85.0 percent of the annual Actuarial Required Contributions (ARC) is made on an annual basis. When the prefunding plan was initiated in 2008, the City contributed less than half a million dollars per year; however, contributions totaled \$2.9 million in FY 2015/16 and are budgeted to increase to \$4.5

million in FY 2017/18. Although the pay-as-you-go plan is a responsible pre-funding strategy, the funding commitments reduce the availability of funds for other purposes.

To limit these ballooning retiree benefit costs, the City negotiated new labor contracts with all of its labor groups in the spring of 2012. These new contracts included a second-tier retirement plan for both the City's public safety and miscellaneous employees, increased employee contributions toward retirement, and established caps on City paid medical benefits. However, recent actuarial changes concerning smoothing policies and mortality rates implemented by CalPERS further increased costs, causing the City to draw from the Pension/Other Post-Employment Benefits (OPEB) Obligation Fund. The Pension/OPEB fund consists of approximately \$20 million in accumulated General Fund savings set aside to enhance the City's ability to weather adverse economic conditions, and prepare for rising pension and OPEB costs. Approximately \$8 million is budgeted to be transferred from the Pension/OPEB fund to the General Fund between FY 2016/17 and 2017/18 to offset increased pension and OPEB costs.

Successor Agency Payment Plan

Due to State law enacted to help balance the State budget, the Brentwood Redevelopment Agency and all other California Redevelopment Agencies (RDAs) were dissolved on February 1, 2012. In Brentwood, the City opted to become the Successor Agency and retained the housing assets and functions of the Redevelopment Low and Moderate Income Housing Fund. Following the dissolution of RDAs, the State Department of Finance (DOF) disallowed \$15.0 million in transfers made from the former Brentwood RDA to the City, for construction of capital projects in the redevelopment area. After an unsuccessful legal challenge, the City and the DOF entered into a 10-year (2016 to 2026), interest free payment plan, whereby the City remits the entirety of the debt to Contra Costa County. Payments from the General Fund for this are approximately \$1.2 million per year. In addition to the \$156 million in formerly anticipated future tax increment revenue the City lost as a result of the RDA's dissolution, the State's denial of fund transfers and subsequent repayment plan limits the City's capacity to obligate General Fund resources towards service and construction and/or maintenance costs of planned capital improvement projects.

Despite rising costs, the City has continued to remain financially healthy. The City has maintained its Council-adopted target of 30 percent reserves in the General Fund, and has accumulated enough in the Pension/OPEB fund to adequately provide resources for emergency conditions. The City has also committed to using the General Fund Fiscal Model to determine the long-term sustainability of prospective policies and programs.

Public Services Funded Outside of the General Fund

The General Fund budget represents 21.5 percent of the City's total FY 2016/17 Operating Budget of \$284.1 million. Several important public services are funded by other restricted revenue sources. For example:

- The City provides residents with solid waste, water and wastewater services, which are budgeted for \$45.0 million in expenditures in FY 2016/17. The charges for these services, along with the cost for providing the services, are accounted for in individual Enterprise Funds. These funds do not receive any General Fund support and are self-supporting, primarily from user fees.
- The Housing Enterprise Fund accounts for the administration of the Housing Enterprise, which includes the Housing Rental Units, Affordable Housing, and First-Time Homebuyers programs.

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One way the City creates affordable housing is by requiring that 2 percent of all newly constructed dwelling units be designated as affordable housing for very-low, low-, and moderate-income households. These units must be integrated into each neighborhood and must be built with the same quality, fit, and finish as market rate units. In FY 2016/17, the Housing Enterprise Fund budgeted \$1.3 million in expenditures.

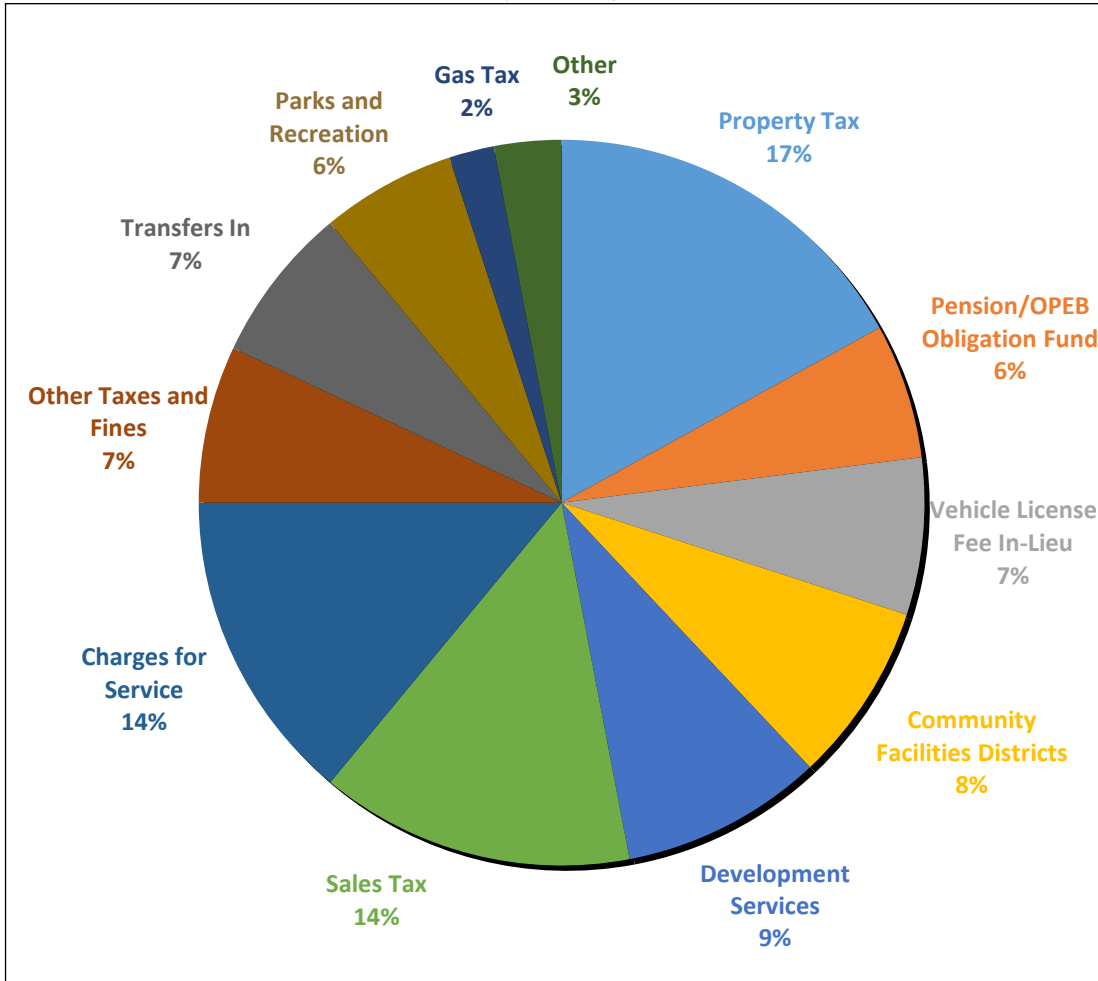
- The City's Capital Fund covers roadway, parks and trails, water, wastewater, community facility, and drainage capital projects. Approximately \$78.9 million is budgeted for FY 2016/17, which is a 53.7 percent year-over-year increase. The majority of this increase is attributed to \$47.0 million in wastewater improvements budgeted in the FY 2016/17 Capital Improvement Plan, \$34.8 million of which is for the expansion of the existing 5 million gallon per day tertiary water treatment facility.
- Internal Service Funds are used to accumulate funds for the replacement of City assets, fund City-wide services such as information services and fleet maintenance, and to accumulate funds to offset the expenses associated with retiree medical costs. Internal Service costs, which are allocated as part of the operating costs of different City departments, are budgeted to increase from \$18.2 million in FY 2015/16, to \$24.2 million in FY 2016/17, representing a 33.0 percent increase. This increase results from a combination of transfers out from the Pension/OPEB Obligations Fund to the General Fund to offset a portion of the impact of increasing Pension and OPEB costs, and a reduction in the Emergency Preparedness Fund balance.
- Other Operating Budget items outside of the General Fund include the Debt Service Funds (\$35.7 million), Special Revenue Funds (\$32.4 million), and City Rentals Enterprise (\$0.5 million).

CURRENT GENERAL FUND REVENUES

The City's FY 2016/17 General Fund revenues are budgeted to total \$53.3 million, representing a 11.0 percent increase over FY 2015/16, when budgeted revenues totaled \$48.0 million. General Fund revenues generally derive from twelve types of sources, including State, county and local taxes; transfers from other City funds; and charges for City services. As shown in Chart 1.3-2, the largest sources of General Fund revenue, by proportion of the total, are property taxes (17.0 percent), sales taxes (14.0 percent), charges for service (14.0 percent), and development services (9.0 percent). Development services are funded through permit fees, while a parks and recreation property tax and user fees help offset operational costs of the Parks and Recreation Department. Community Facilities Districts (CFDs), which are special voter-approved taxes in specific locations within the city, comprise 8.0 percent of General Fund revenue. Transfers from other City funds, Motor Vehicle License Fee In-Lieu revenues, and other taxes and fines each comprise 7.0 percent of General Fund revenue, while the Pension/OPEB Obligation Fund comprises 6.0 percent of General Fund revenues. Gas tax and other sources contribute 2.0 percent and 3.0 percent, respectively.

The City of Brentwood relies on eight major ongoing revenue sources to balance the City's General Fund budget, which are projected to comprise approximately 64.0 percent of the General Fund revenue in FY 2016/17. As shown in Table 1.3-1, ongoing revenue sources include property taxes, sales taxes, development fees, CFDs, motor vehicle in-lieu fee revenues, parks and recreation property taxes, franchise fees, and gas taxes. Each of these sources is discussed in more detail below.

CHART 1.3-2: GENERAL FUND REVENUE SOURCE, FY 2016/2017



SOURCE: CITY OF BRENTWOOD. OPERATING BUDGET, FY 2016/17-FY 2017/18; BAE, 2016.

TABLE 1.3-1: MAJOR RECURRING GENERAL FUND REVENUE SOURCES, FY 2016/17

REVENUE SOURCE	AMOUNT, \$
Property Tax	9,524,671
Sales Tax	7,249,812
Development Fees	4,888,991
Community Facilities Districts	4,009,571
Motor Vehicle In-Lieu Fees	3,786,604
Parks and Recreation Property Tax	1,975,206
Franchise Fee	1,529,182
Gas Tax	1,243,627
Sub-Total	34,207,664
Other Recurring Revenue Sources	19,119,212
TOTAL	53,326,876

SOURCE: CITY OF BRENTWOOD. OPERATING BUDGET, FY 2016/17-FY 2017/18; BAE, 2016.

Property Tax

Property tax revenue is the General Fund's largest individual revenue source, but, as experienced during the recession, can be variable depending on real estate market conditions. The City of Brentwood receives approximately 11.18 percent of the one percent ad-valorem property tax levied by the County of Contra Costa. With increasing home prices and steady growth in new housing construction, property tax revenue has steadily increased since FY 2012/2013, when revenue was estimated at \$6.1 million (\$117.45 per capita), and represented 16.0 percent of General Fund revenue. During FY 2014/15 and 2015/16, revenues increased 18.6 percent and 12.3 percent, respectively; however, estimates for FY 2016/17 and 2017/18 project significantly slower growth.

The FY 2016/17 budgets property tax revenue of \$9.5 million (\$163.0 per capita), which is a 4.5 percent increase over budgeted revenues in 2015/16, and represents 17.0 percent of General Fund revenues. The FY 2017/18 budgeted revenue of \$10.0 million represents 4.4 percent growth over budgeted revenue for the previous fiscal year. Budgeted property tax revenues are based on a combination of factors, including estimates of new housing development, increased taxable values from property turnover throughout the year, and change in the California Consumer Price Index. Reasons for the budgeted slowdown in property tax revenue growth include slower housing construction in FY 2016/17 and FY 2017/18, compared to FY 2014/15 and FY 2015/16, and lower than normal Consumer Price Index (CPI) adjustments. The City budgets property tax revenue based on new housing development estimates, increased taxable values from turnover, and by change in the CPI. Although Proposition 13 allows the assessed value of real estate that is not sold or improved to increase up to two percent per year, the State Board of Equalization adjusted CPI 1.525 percent in FY 2016/17, which resulted in conservative property tax revenue projections.

Sales Tax

Sales tax revenue is the General Fund's second largest individual revenue source (14.0 percent) and can be highly variable depending upon the economy, particularly for discretionary items like automobiles and luxury goods. The City of Brentwood receives one percent of all taxable sales generated within its borders, which includes final sales to consumers as well as business-to-business sales. In addition to this one percent share, the City receives a portion of an additional Statewide voter-approved 0.5 cent sales tax, which is dedicated for public safety purposes. Brentwood's sales tax revenues have posted modest annual increases throughout the past decade, even during the economic downturn when sales tax revenue fell statewide. This resiliency is due, in part, to the City's diverse sales tax base and under-reliance on any single large entity or business type (e.g., malls or major auto dealerships). The sales tax budgeted for FY 2016/17 is \$7.2 million, not including the public safety portion. Due to a one-time payment from the State in FY 2015/16, sales tax revenue appears flat in FY 2016/17 compared to the previous fiscal year projections; however, excluding the one-time payment, budgeted sales tax revenue increased 5.0 percent.

Development Fees

Development fees cover the cost of inspection, plan retention, record keeping, materials investigation, special inspection management, and overhead of the Building, Planning and Engineering divisions. Like sales tax, development fee revenue is highly variable depending on the market. The City's development revenues have benefited from increased development activity since the depths of the recession in FY 2008/09. Development fee revenue peaked around \$5.7 million in FY 2013/14 and FY 2014/15, compared to FY 2012/13 when development fee revenue totaled \$3.5 million. The spike in development

fee revenue during FY 2013/14 and 2014/15 resulted primarily from 951 new single-family dwelling permits issued those years. In FY 2016/17, \$4.9 million in revenue is budgeted based on 350 anticipated new single-family dwelling permits, while \$4.8 million is budgeted in FY 2017/18 based on an estimated 325 new single-family dwelling permits.

Community Facilities District Special Taxes

Since 2002, the City of Brentwood has established four CFDs under the 1982 Mello-Roos Community Facilities Act. The CFDs were formed to provide an annual revenue stream from all new development within the City to fund the purchase, construction, and/or expansion of various authorized public facilities and the operation and maintenance of authorized City improvements and services. All new developments in the City are required to participate in a CFD. The City uses a Special Revenue Fund to account for special taxes levied on property owners for certain facilities and services including police services, joint use school facilities, and the construction, acquisition, and maintenance of open spaces, flood drains, and storm drains.

The City annually budgets to transfer a portion of this revenue into the General Fund, primarily to pay for public safety services for the areas where the special taxes are collected. In FY 2016/17, the CFDs are budgeted to generate \$4.0 million in revenue for the General Fund, \$3.0 million of which will be generated from the three CFDs that have a portion of their boundaries in Priority Area 1. Part of this growth is attributed to a one-time transfer for the City's support of interim regional fire service in 2016/17. Overall, CFD revenues grew 15.6 percent, from FY 2015/16 when budgeted transfers to the General Fund totaled \$3.5 million, to FY 2016/17, when budgeted transfers totaled \$4.0 million. Over the past decade, CFD revenue grew in-line with development, which is expected to continue with increased commercial and industrial growth, as well as 675 new single-family home permits expected to be issued during FY 2016/17 and FY 2017/18.

Motor Vehicle License In-Lieu Fees

The State Revenue and Taxation code imposes an annual license fee of two percent of the market value of motor vehicles in-lieu of a local motor vehicle property tax. The timing of the payments and the method of calculation has changed with the State Budget Act of 2004. Most of the motor vehicle fee revenue has been replaced by Property Tax In-Lieu of Vehicle License Fee (ILVLF) revenue. As a result of the State Budget Act of 2014, allocation of Motor Vehicle In-Lieu Tax is driven by change in the City's assessed value for property taxes, rather than population. Over the past two years, the City's assessed valuation increased dramatically and, as a result, ILVLF revenue increased an average of 13.0 percent per year between FY 2013/14 and FY2015/16. The 2016/17 Operating Budget expects ILVLF revenue growth to slow to 3.6 percent in FY 2016/17, and 4.5 percent in FY 2017/18.

Parks and Recreation Property Tax

In addition to the share of ad-valorem property tax allocated to the General Fund, the City of Brentwood Parks and Recreation Department receives a share of approximately 2.27 percent of this one percent levy for property located within the City limits, or \$2.0 million in FY 2016/17.

Franchise Fees

The City charges franchise fees to local wireless, cable, telephone, and electric utilities for their use of City-owned streets and right-of-way. As the City has grown and the demand for enhanced services has increased, the City has seen tremendous growth in franchise fee revenue. Franchise fees are largely

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insulated from the ups and downs of the economy and are budgeted to contribute \$1.5 million to the General Fund in FY 2016/17.

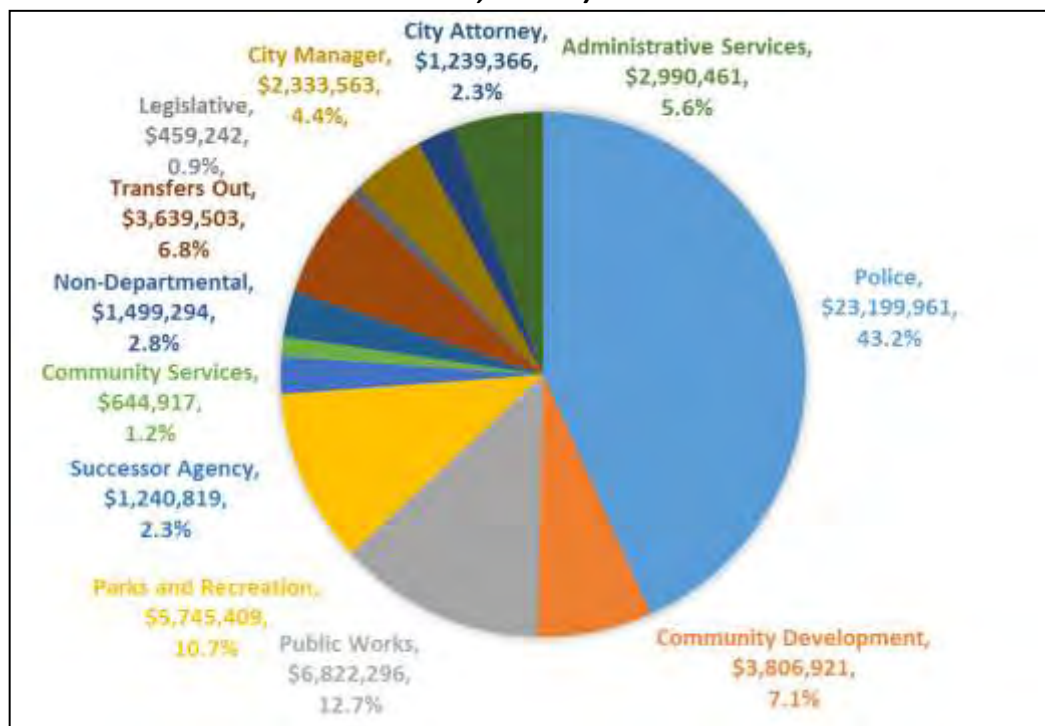
Gas Tax

The State of California imposes a 17.3 cent per gallon tax on motor vehicle and aircraft fuel. A portion of these funds are then allocated to cities to help fund street improvements and maintenance. In FY 2016/17, the City expects to receive approximately \$1.2 million in revenues from this source, or 2.0 percent of all General Fund revenues. Gas tax revenues fell 20.3 percent between FY 2014/15 and FY 2016/17 budget estimates as a result of declining gasoline prices and consumption, and the effect of the State “true ups” under the fuel tax swap system.

CURRENT GENERAL FUND EXPENDITURES

The City’s FY 2016/17 budgeted General Fund expenditures totaled \$53.6 million, representing a 13.6 percent increase over FY 2015/16, when budgeted expenditures totaled \$47.2 million. Chart 1.3-3 shows the General Fund expenditures by category.

CHART 1.3-3: GENERAL FUND EXPENDITURES, FY 2016/2017



SOURCE: CITY OF BRENTWOOD. OPERATING BUDGET, FY 2016/17-FY 2017/18; BAE, 2016.

On a per capita basis, General Fund expenditures increased from \$772 budgeted in FY 2015/16, to \$889 in FY 2016/17. Most of this increase is attributed to the opening of the dispatch center, required payments under the Successor Agency Payment Plan, and increasing OPEB costs. As shown in Chart 1.3-3, in FY 2016/17 the most significant expenditure was the Police Department, whose budget amounts to \$23.2 million or 43.2 percent of all General Fund expenditures. Public Works, Parks and Recreation, and Community Development accounted for an additional 12.7, 10.7 and 7.1 percent, respectively. In these three departments, the most significant budgeted General Fund cost items are streets (\$3.3 million), parks and recreation administration (\$2.0 million), building (\$2.4 million), planning (\$1.4 million), and

landscape operations (\$1.1 million). Total General Fund expenditures include personnel services, supplies and services, and internal services, which are discussed in more detail below. It is noted that the FY 2016/17 budget is projected to include an Undesignated Reserve of \$14.9 million (which includes funds set aside from prior fiscal years), ensuring the City maintains its goal of 30 percent reserves. The City maintains a strict policy of not using these reserves for ongoing operating costs.

Personnel Services

Most of the General Fund operating costs stem from staff salaries and benefits. The Personnel Services cost category comprises approximately 60.0 percent of General Fund expenditures, increasing from \$28.2 million in FY 2015/16 to \$30.2 million in FY 2016/17, representing a 7.4 percent increase. This increase is mainly driven by development of the new Brentwood Police Dispatch Center, and standard salary and benefit adjustments for existing employees. The dispatch center required two additional staff persons in FY 2015/16, and ten additional staff in FY 2016/17. The total personnel dispatch budget for FY 2016/17 is \$1.3 million, and budgeted at \$1.7 million in FY 2017/18, with a portion of these personnel costs offset by the termination of the City of Antioch dispatch contract. Aside from the new dispatch employees, no new General Fund employees are budgeted for FY 2016/17 or FY 2017/18.

Supplies and Services

The General Fund Supplies and Services expenditures are budgeted to increase 15.6 percent, from \$8.6 million projected in 2015/16, to 11.2 million budgeted for FY 2016/17, due to the following significant items:

SUCCESSOR AGENCY PAYMENT PLAN

As discussed previously, the DOF disallowed \$15.0 million in transfers from the former Brentwood RDA to the City for capital projects in the redevelopment area. As a result, the City and the DOF agreed on a 10-year, interest free repayment plan, whereby the City remits the entirety of the debt to Contra Costa County. The budgeted amounts for FY 2016/17 and FY 2017/18 are \$1.2 million and \$1.3 million, respectively. As one of numerous taxing entities affected by this repayment of Redevelopment Funds, the City General Fund will receive approximately 16.6 percent of the remittance payment as a distribution from Contra Costa County. The impact on the overall operating budget is minimized through the use of reserves and/or transfers from the Pension/OPEB Obligation Fund.

DISPATCH CENTER

The dispatch center's Supplies and Services budget is estimated at \$0.5 million for FY 2016/17. While some cost saving is expected from the termination of the \$1.0 million contract with the City of Antioch, additional personnel costs are expected to exceed these cost savings.

STRATEGIC INITIATIVES

The FY 2016/17 and FY 2017/18 Strategic Plan, adopted by the City Council in February 2016, focuses the City's budget on elements set by the Brentwood General Plan, adopted in 2014. The Strategic Plan identifies goals envisioned in the General Plan and specific initiatives to achieve those goals for six focus areas, including infrastructure, public safety, economic development, land use planning, community and neighborhood services, and fiscal sustainability and operational management. Examples of Strategic Plan initiatives include opening the dispatch center, preparing the Priority Area 1 Specific Plan, and roadway improvements for Priority Area 1, among others. To support the cost of the General Fund

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strategic initiatives, the Supplies and Services budget increased by \$0.7 million in FY 2016/17, and \$0.4 million in FY 2017/18. To offset the cost of these initiatives, one-time transfers from other funds, totaling \$1.3 million are budgeted in FY 2016/17, which will cover both budget years. These transfers in will also support transfers out to the Capital Improvement initiatives, which are not included in the Supplies and Services Budget, while a portion of the transfers will also be reserved in the General Fund to support initiatives postponed until after FY 2017/18.

INTERNAL SERVICES

Internal Services expenditures are budgeted to increase 20.8 percent, from \$7.1 million in FY 2015/16, to \$8.5 million in FY 2016/17. This increase is primarily the result of increased technology replacement expenditures, the addition of the dispatch center, and rising costs associated with OPEB. Increasing retiree medical costs, and the continuation of the City's OPEB prefunding plan are expected to increase Internal Service costs by \$1.0 million in FY 2016/17.

PRIORITY AREA 1 FISCAL CONSIDERATIONS

Service Standards for General Fund Functions

This section identifies published service standards and objectives for key General Fund functions. Where none are available, current service levels are noted. These service standards are important, because they indicate the level of service, and associated expenditures, that the City will strive to maintain as the City grows in the Specific Plan Area.

Police

Per the FY 2016/17 Budget, the Police Department has 66 authorized sworn positions, 12 dispatch positions, and 17 various support positions. The Police Department is located at 9100 Brentwood Boulevard, which is approximately one mile from City Hall. There is one substation on the north side of Sand Creek Road, east of State Route 4, in the Streets of Brentwood commercial development. The General Plan stipulates that the City should maintain a police force level of 1.5 to 2.5 officers per 1,000 residents. At present, the City employs approximately 1.25 sworn officers per 1,000 residents.

The City of Brentwood tracks four major Police Department organizational benchmarks: 1) Response Times, 2) Incidents of Crime & Crime Rates, 3) Workload and 4) Clearance Rates. The following sections are based on the Police Department's 2016 Performance Report.

RESPONSE TIMES

Between 2011 and 2015, the City of Brentwood Police Department's average response times varied between 4 minutes, 42 seconds and 4 minutes, 51 seconds for Priority One emergencies (immediate threat to life or crimes in progress). Response times for Priority Two calls varied between 5 minutes, 30 seconds and 5 minutes, 46 seconds. Between 2014 and 2015, response times increased five seconds for Priority One calls, and two seconds for Priority Two calls; however, the 2015 response times are at or below the five-year average.

INCIDENTS OF CRIME AND CRIME RATE

Incidents of crime are the total number of Part 1 crimes¹ that occurred in a calendar year. Between 2006 and 2015, the number of Part 1 violent crimes ranged between 1,373 and 1,833 incidents per year, with an average of 1,700 incidents. During the same time period, the number of Part 1 crimes committed annually per 1,000 residents ranged between 26.47 and 37.41, with an average of 32.5 crimes.

WORKLOAD

Workload items involve calls for service, crime incidents, cases taken, traffic collisions, arrests, citations, and traffic or pedestrian stops based on suspicious activity. Between 2006 and 2015, the number of individual workload items ranged between 32,263 and 36,440, which meant that each sworn officer was charged with an average of 563 workload items each year. In terms of residents, police workload items were generated at a rate of 1.6 items per resident in 2015.

CLEARANCE RATES

Clearance Rates represent the police department's ability to close cases, usually with an arrest. In 2015, the Department's overall clearance rate was 26.6 percent, ranging from seven percent for burglary to almost 66.0 percent for assault. Compared to the 2014 FBI clearance rates, the City of Brentwood is below the national average for closing rape, burglary, theft, and auto thefts cases, but meets or exceeds national averages for murder, robbery, arson and assault.

Parks

The City places high importance on maintaining its park and recreation facilities. Brentwood has approximately 252.5 acres of developed parkland, 70 park facilities, 17 pocket parks and trailheads, over 19 miles of trails, and 60 miles of bike lanes. According to the FY 2015/16 Parks and Recreation Annual Report, an additional 20 park sites were identified for future expansion, which will be developed as the housing market continues to improve and residential development proceeds. At full build-out, the City's park inventory will total 92 parks, pocket parks and trailheads. The General Plan stipulates acquisition, maintenance and construction of new recreation facilities is to be funded through the continued collection of Parks and Recreation Development Impact Fees.

The General Plan sets an overall City standard of 5.0 acres of parkland for each 1,000 residents for the city overall, requiring 3.0 acres of Neighborhood Parks per 1,000 residents, and 2.0 acres of Community Parks per 1,000 residents. Per the FY 2015/16 Parks and Recreation Annual Report, the City owned 252.5 acres of parkland at the end of 2015, representing a ratio of 4.41 acres of parkland per 1,000 residents.

Roadway Maintenance

Public roadways and related improvements (other than State highways) within the city are owned, improved and maintained by the City. Street maintenance includes street sweeping and catch

¹ Crimes including murder, rape, robbery, arson, assault, burglary, theft and auto theft are categorized as Part 1 crimes, which are the statistics that are tracked by both the FBI and by local jurisdictions. For clarification purposes, robbery is taking property from a person by force or the threat of force. Theft is taking property of another without their permission.

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basin/storm drain repairs to implement National Pollutant Discharge Elimination System (NPDES) requirements. The City maintains 192 miles of streets, including 5,957 street lights, 65 traffic signals, and 9,416 traffic signs.

PRIORITY AREA 1 REVENUE IMPLICATIONS

The City of Brentwood has structured its budget and operations such that much of the infrastructure capital requirements and some operating cost requirements related to serving new development are funded by developer fees and special taxes collected from new development. Nonetheless, new development in the Specific Plan Area will affect some General Fund revenue streams, as detailed below.

Property Taxes

Property tax revenues are the most important source of revenue for Brentwood's General Fund, accounting for \$9.5 million in FY 2016/17. The City's property tax revenues increase as property values rise in response to market trends and new development activity. Single-family homes in Brentwood sold for a median price of \$485,000 to \$510,000, with average price per square foot ranging from \$228 to \$242, between May and October 2016.² The median sale price for multifamily attached units (e.g., condominiums and townhomes) sold during the same period ranged from \$169,900 to \$485,000, with the average price per square foot ranging from \$204 to \$350.³

The City's exact share of a particular parcel's property tax is determined by the Tax Rate Area (TRA) within which the parcel is located. Appendix A contains a list of the five TRAs located within the Specific Plan Area, as well as the exact share of the one percent County property tax that is remitted to the City. Figure 1.3-1 maps the TRAs in the Specific Plan Area, with the lighter shades of blue signaling that a lower proportion of property tax revenues are remitted to the City and darker shades indicating a higher share accruing to the City. Four TRA's have tax rates between roughly 9.65 and 9.88 percent, while the most southwesterly TRA (10001) has a tax rate of 13.38 percent, which is the TRA with the highest City property tax share, citywide. Except for TRA 10001, TRAs in Priority Area 1 are generally below the citywide average of 10.07 percent. Due to the varying tax allocation factors, the geographic distribution of growth in the Specific Plan Area will affect the City's portion of future property tax revenues. For example, should the residential real estate market continue to operate within the price ranges reported above, the City of Brentwood would receive between \$477 and \$502 in annual property tax revenues for each new single-family home constructed, and between \$167 and \$477 for each new multifamily unit, based on the City's 9.84 percent share of property taxes received in TRA 10094. To the extent that growth occurs in TRAs other than 10001, this could mean that the City will be more dependent upon revenues other than property taxes than in other areas, to achieve fiscal balance.

Sales Taxes

After property tax revenues, sales tax revenues are the General Fund's largest individual revenue source, accounting for \$7.2 million in FY 2016/17 or approximately \$137 per capita. The City of Brentwood receives a share equal to one percent of all taxable sales generated within its borders, which includes final sales to consumers as well as business-to-business sales. In addition to this one percent

² Bay East Association of Realtors. (October 2016). *Brentwood Detached Single-Family Homes*. Available at: https://bayeast.org/bayeast/uploads/brentwood_attached.pdf

³ Bay East Association of Realtors. (October 2016). *Brentwood Condominiums and Townhomes*. Available at: https://bayeast.org/bayeast/uploads/brentwood_attached.pdf

share, the City receives an additional statewide voter-approved 0.5 percent sales tax amount which is dedicated for public safety purposes. Projecting an increase in local sales taxes attributable to new development can be difficult due to the complex interactions between shoppers and retail supply. Ultimately, overall sales tax generation is a function of the amount of taxable goods purchased within the City. This is a finite amount which is driven by household demand for taxable goods, but is constrained by the limits of personal income and the availability of goods to purchase (supply).

The Priority Area 1 Specific Plan may influence the City of Brentwood's sales tax revenues in several ways. First, a plan that increases the resident population will tend to increase the captive base of retail demand within the city. Some, but not all, of the new residents' taxable expenditures will be made in stores located in Brentwood, generating new local sales taxes. Second, a plan that increases the supply of retail space (e.g., stores or restaurants) within the city will create the potential to increase the capture of expenditures and sales taxes from residents living elsewhere in Brentwood as well as from shoppers who may be attracted from other communities to take advantage of the expanded local retail offerings. Third, an alternative that attracts visitors to Brentwood who would not otherwise visit may induce those visitors to also shop in the city as an indirect effect of them being attracted to Brentwood for their primary activity. Finally, if the Priority Area 1 Specific Plan successfully attracts industrial or office users who sell products to end-users, the City may realize sales tax revenues from business-to-business sales activity.

Community Facilities District Assessments

As noted previously, all new developments in the city are required to participate in a Community Facilities District (CFD). The CFDs, which are not geographically contiguous, levy special taxes on property owners for certain facilities and services including police services, joint use school facilities, and the construction, acquisition and maintenance of open spaces, flood drains and storm drains. The special taxes vary by type of use, as well as by district.

Based on City policy, any new development in the Specific Plan Area would annex to the most recently formed CFD, which is currently CFD 5. Approximately 86 percent (\$441,937) of the CFD's total annual revenue was transferred to the General Fund in FY 2015/16 to pay for public safety expenses, while an additional 1.3 percent (\$6,994) covered the costs of collection and administration. Table 1.3-2 presents calculations based on the FY 2014/15 budget, which indicate that single-family homes and rural residences in CFD 5 contributed \$746 per unit in special taxes. Condominiums contributed \$560 per unit, multi-family units contributed \$372 per unit, and commercial, industrial, or institutional development contributed \$1,332 per acre. These ranges provide insight into how new development in Priority Area 1 might generate additional CFD contributions to General Fund revenues; however, depending on the specific fiscal projections for Priority Area 1, it is possible that the City may determine that a new CFD should be formed, to cover future development in the area rather than having the areas annex into CFD 5, which might entail CFD levies that are higher or lower than the current rates for CFD 5 in order to achieve an appropriate fiscal balance. In any event, augmented support from CFDs is an important source of funding that helps the City maintain service levels as it grows.

1.0 LAND USE AND SOCIOECONOMICS

TABLE 1.3-2: FY 2014/15 CFD SPECIAL TAXES AND GENERAL FUND TRANSFERS, BY LAND USE

CFD 5	PER SINGLE-FAMILY HOME OR RURAL RESIDENCE	PER CONDOMINIUM	PER MULTI-FAMILY UNIT	PER COMMERCIAL, INDUSTRIAL, OR INSTITUTIONAL ACRES
FY 2014/15 Levied Rate	\$746	\$560	\$373	\$1,332
General Fund Transfers	\$643	\$483	\$321	\$1,148

NOTE: THE PER UNIT AND PER ACRE GENERAL FUND TRANSFERS ARE CALCULATED BASED ON THE PROPORTION OF THE TOTAL CFD BUDGET THAT WAS TRANSFERRED TO THE GENERAL FUND IN FY 2014/15. FOR CFD 5, 86% OF TOTAL FUNDS WERE TRANSFERRED TO THE GENERAL FUND.

SOURCE: CITY OF BRENTWOOD FY 2014/15 REPORT FOR SPECIAL TAXES LEVIED; BAE, 2016.

Property Tax in Lieu of Vehicle License Fees

As explained above, Property Tax In-Lieu of VLF (ILVLF) is a revenue source that is tied to changes in assessed valuation, as opposed to changes in population. In FY 2016/17, ILVLF totaled \$3.8 million based on a local assessed value of \$8.5 billion. The ratio between these two figures indicates that, as property values increase and development activity continues in Brentwood, the City's General Fund can expect to receive an additional \$4.46 annually for each additional \$10,000 dollars in local assessed valuation.

Transient Occupancy Tax

The City of Brentwood has a Transient Occupancy Tax (TOT) rate of 10.0 percent. Per the Comprehensive Annual Financial Report (CAFR) for FY 2014/2015, the City received \$349,683 in General Fund revenue from two hotels located within the city. Should the Priority Area 1 Specific Plan include plans for a new hotel or motel, and there is market support for such development, the City might see an increase in revenues from this funding source. Given the small base of existing hotels that generate TOT for the City, a new lodging facility in the Specific Plan Area could contribute to a significant increase in the City's overall TOT receipts. It is generally believed that hotels generating TOT revenue, along with property taxes and other ancillary City revenues that they generate, are a fiscally positive land use; thus, if the Priority Area 1 Specific Plan includes a hotel, it could make a positive contribution to the fiscal sustainability of the land use plan.

PRIORITY AREA 1 COST IMPLICATIONS

Table 1.3-3 documents the current average net costs of City services financed through the General Fund. These average cost figures provide insights into how General Plan expenditures will change as the city grows in the Specific Plan Area. The costs shown in the table assume a continuation of current service levels. For upcoming work on the Priority Area 1 Specific Plan, the cost levels shown in the table will serve as a starting point to model the increased General Fund costs that new development in the Specific Plan Area will generate. However, the fiscal impact model to be prepared for the Specific Plan will also consider factors such as: the extent to which some departmental costs may not necessarily increase in a linear fashion as new development occurs due to some existing costs remaining "fixed" as the community grows; or conversely, due to new development in the Specific Plan Area triggering disproportionate cost increases because of special service requirements that are unique to the area or the nature of new development.

TABLE 1.3-3: AVERAGE NET GENERAL FUND COSTS, BY DEPARTMENT, FY 2016/17

DEPARTMENT	COST
Legislative	\$7 Per Service Population
City Manager	\$37 Per Service Population
City Attorney	\$19 Per Service Population
Administrative Services	\$47 Per Service Population
Successor Agency	\$20 Per Service Population
Community Development	\$60 Per Service Population
Community Services	\$10 Per Service Population
Parks and Recreation	\$98 Per Resident \$27,622 Per Acre of Maintained Open Space
Police	\$365 Per Service Population \$351,515 Per Sworn Officer
Public Works	\$107 Per Service Population \$35,533 Per Mile of Maintained Roadway

NOTE: "SERVICE POPULATION" INCLUDES ALL RESIDENTS, AND HALF OF THE PEOPLE EMPLOYED WITHIN THE CITY.

SOURCES: CITY OF BRENTWOOD FY 2014/15 OPERATING BUDGET; CALIFORNIA DEPARTMENT OF FINANCE TABLE E-1, JANUARY 1, 2015 AND 2016; ASSOCIATION OF BAY AREA GOVERNMENTS, PROJECTIONS 2013; BAE, 2016.

PRIORITY AREA 1 LAND USE CONSIDERATIONS

The Priority Area 1 Specific Plan represents an important component of the City of Brentwood’s land available for future development under the City’s General Plan. The Specific Plan Area is important because of its position at a key location along State Route 4, and because it represents a significant portion of the City’s overall developable land supply. The discussion that follows explores the role of the Priority Area 1 Specific Plan in addressing the City’s long-term needs for land that can support residential and non-residential development.

Citywide Land Capacity for Economic Development

De Novo Planning Group provided BAE Urban Economics (BAE) with a database of vacant and underutilized parcels within the city of Brentwood that are designated for non-residential development. BAE utilized this information to compile a summary of the City’s remaining development capacity for job-generating land uses, including commercial (i.e., retail), office, industrial, and other non-residential uses. As shown in Table 1.3-4, the City’s total remaining capacity development for job-generating land uses is approximately nine million square feet of space. Of this, just under half of the capacity is associated with commercial development with office and industrial development representing just over and just under one fourth of the total, respectively.

TABLE 1.3-4: CITYWIDE NON-RESIDENTIAL DEVELOPMENT CAPACITY, GENERAL PLAN BUILDOUT

LOCATION	COMMERCIAL		OFFICE		INDUSTRIAL		OTHER, NON-RESIDENTIAL		TOTAL, ALL NON-RESIDENTIAL	
	S.F.	%	S.F.	%	S.F.	%	S.F.	%	S.F.	%
Priority Area 1	1,693,642	40.3	740,344	29.7	740,344	35.6	0	0	3,174,330	35.4
Remainder of City	2,510,112	59.7	1,749,047	70.3	1,339,002	64.4	200,002	100	5,798,162	64.6
Total, Citywide	4,203,754	100	2,489,391	100	2,079,346	100	200,002	100	8,972,492	100

NOTE: S.F. = SQUARE FEET.

SOURCES: CITY OF BRENTWOOD, 2016; DE NOVO PLANNING GROUP, 2016; BAE, 2016.

Projected Development Capacity Needed to Support Economic Development

It is important for cities to develop land use patterns that can balance residential development opportunities to help address the region’s burgeoning demand for new housing with provision of locations for new and growing businesses that can provide jobs for local residents and help to diversify the City’s revenue base to be able to support high quality local services. Recognizing that Brentwood has historically captured strong demand for new residential development, but has had more limited success with attracting jobs (particularly higher wage jobs that require higher skills), the City of Brentwood retained Craft Consulting to prepare a citywide economic development strategy that will help the City focus its efforts on bolstering local economic growth.

As part of the economic development strategy effort, Craft Consulting estimated the local job growth potential under several different economic development scenarios, and has also estimated the amount of land and building space that would be needed to accommodate those scenarios. Table 1.3-5 includes draft estimates of the non-residential building capacity that Craft Consulting has estimated for key job sectors, including light industrial and manufacturing uses. As shown in the table, Craft Consulting has estimated that the City would need approximately 58 acres of land and 900,000 square feet new building space to accommodate the low-end estimate of growth potential (1.3% annual average growth) through 2040, and 188 acres and 2.9 million new building square feet to accommodate the high-end growth (3.3% annual average growth) potential in these sectors.

TABLE 1.3-5: NON-RESIDENTIAL DEVELOPMENT CAPACITY NEEDED TO SUPPORT ECONOMIC DEVELOPMENT THROUGH 2040

Low Range Estimate (1.3% Average Annual Growth)						High Range Estimate (3.3% Average Annual Growth)					
Base Year (2016)	Net New Jobs	Sq. Vacancy		FAR	# Acres	Base Year (2016)	Net New Jobs	Sq. Vacancy		FAR	# Acres
		Ft./Employee	Rate					Ft./Employee	Rate		
		500	6.0%	0.35	43,560			500	6.0%	0.35	43,560
		Space	Total	Land Area			Space	Total	Land Area		
		Requirement	Bldg Area	(sf)	# Acres		Requirement	Bldg Area	(sf)	# Acres	
2017	59	29,705	31,601	90,289	2	2017	151	75,405	80,218	229,195	5
2018	60	30,091	32,012	91,463	2	2018	156	77,893	82,865	236,758	5
2019	61	30,482	32,428	92,652	2	2019	161	80,464	85,600	244,571	6
2020	62	30,879	32,850	93,856	2	2020	166	83,119	88,425	252,642	6
2021	63	31,280	33,277	95,076	2	2021	172	85,862	91,343	260,979	6
2022	63	31,687	33,709	96,312	2	2022	177	88,696	94,357	269,591	6
2023	64	32,099	34,147	97,564	2	2023	183	91,622	97,471	278,488	6
2024	65	32,516	34,591	98,832	2	2024	189	94,646	100,687	287,678	7
2025	66	32,939	35,041	100,117	2	2025	196	97,769	104,010	297,171	7
2026	67	33,367	35,497	101,419	2	2026	202	100,996	107,442	306,978	7
2027	68	33,801	35,958	102,737	2	2027	209	104,329	110,988	317,108	7
2028	68	34,240	36,426	104,073	2	2028	216	107,771	114,650	327,573	8
2029	69	34,685	36,899	105,426	2	2029	223	111,328	118,434	338,383	8
2030	70	35,136	37,379	106,796	2	2030	230	115,002	122,342	349,549	8
2031	71	35,593	37,865	108,185	2	2031	238	118,797	126,380	361,084	8
2032	72	36,055	38,357	109,591	3	2032	245	122,717	130,550	373,000	9
2033	73	36,524	38,856	111,016	3	2033	254	126,767	134,858	385,309	9
2034	74	36,999	39,361	112,459	3	2034	262	130,950	139,309	398,024	9
2035	75	37,480	39,872	113,921	3	2035	271	135,271	143,906	411,159	9
2036	76	37,967	40,391	115,402	3	2036	279	139,735	148,655	424,727	10
2037	77	38,461	40,916	116,902	3	2037	289	144,347	153,560	438,743	10
2038	78	38,961	41,448	118,422	3	2038	298	149,110	158,628	453,222	10
2039	79	39,467	41,986	119,961	3	2039	308	154,031	163,862	468,178	11
2040	80	39,980	42,532	121,521	3	2040	318	159,114	169,270	483,628	11
	1,661	830,393	883,397	2,523,992	58	Total	5,391	2,695,741	2,867,809	8,193,740	188

Source: Craft Consulting, 2016

Based on a comparison of the existing citywide industrial development capacity shown in Table 1.3-4, and the industrial and manufacturing development capacity needed under Craft Consulting’s economic development scenarios, the City of Brentwood’s existing industrial land supply is insufficient to accommodate industrial development that is consistent with the upper end economic development scenario, with capacity to accommodate about 2.1 million square feet of industrial development versus potential demand for about 2.8 million square feet of industrial development. This indicates that the City should strive to preserve and even expand its industrial land supply to ensure that it can fully capitalize on economic development opportunities that will be articulated in the forthcoming citywide economic development strategy.

Citywide Land Supply for Residential Development

De Novo Planning Group provided BAE with a database of existing vacant and underutilized properties within the city that are designated for residential development. This information in Table 1.3-6 shows that the city’s existing land inventory can support development of approximately 8,800 additional residential units through estimated General Plan buildout. This includes about 3,500 new single-family residential units (about 40% of the total) and about 5,300 multi-family units (about 60% of the total).

TABLE 1.3-6: CITYWIDE RESIDENTIAL DEVELOPMENT CAPACITY, GENERAL PLAN BUILDOUT

LOCATION	SINGLE-FAMILY		MULTI-FAMILY		TOTAL	
	UNITS	%	UNITS	%	UNITS	%
Priority Area 1	0	0	1,443	27.1	1,443	16.4
Remainder of City	3,492	100	3,878	72.9	7,370	83.6
<i>Total, Citywide</i>	<i>3,492</i>	<i>100</i>	<i>5,321</i>	<i>100</i>	<i>8,813</i>	<i>100</i>

SOURCES: CITY OF BRENTWOOD, 2016; DE NOVO PLANNING GROUP, 2016; BAE, 2016.

Projected Land Supply Needed for Residential Development

Housing growth projections prepared by the Association of Bay Area Governments (ABAG), the regional planning agency for the nine-county Bay Area, provide an indicator of the potential long-term need for residential land supply within the region’s communities. According to ABAG’s Plan Bay Area forecast of housing growth by jurisdiction, the city of Brentwood can be expected to add 1,900 housing units for the time period 2010 to 2040, or an average of approximately 630 housing units per decade. This represents a considerable slow-down from the city’s historic growth rates; however, this would indicate that Brentwood has well over a 100-year supply of residential development capacity. In the case of Brentwood, the ABAG Plan Bay Area projections may be somewhat conservative, reflecting a regional policy goal of directing new development to urban centers and locations that are well served by transit. Since the economic recovery began, the Bay Area region has experienced very strong housing demand fueled by strong job growth driven by the tech sector. The city’s more recent residential development trend, from 2010 to 2016, provides a different perspective on the City’s long-term development potential. During this time period, the number of housing units in the city increased by an average of 266 units per year. If this average continued, the city’s existing land supply would be sufficient to meet residential demand for 33 years, which is beyond the typical 20- to 30-year time horizon for a General Plan. With these different growth rates potentially bracketing high and low-end residential growth estimates for Brentwood, the city has a robust supply of residential land, which should be adequate for the several decades, if not beyond.

Priority Area 1 Contribution to Citywide Land Supply

As mentioned at the beginning of this section, the Priority Area 1 Specific Plan plays an important role in contributing to the city's overall supply of land that is developable to support residential development and economic development. The following sections discuss the portion of citywide development potential that the Priority Area 1 Specific Plan contributes to the city's overall land supply.

CONTRIBUTION TO CITYWIDE LAND SUPPLY FOR ECONOMIC DEVELOPMENT

With the potential citywide industrial/manufacturing land supply shortage discussed above as context, the industrial development capacity within the Specific Plan Area, which represents about 35 percent of the city's total supply to accommodate industrial/manufacturing uses, should be considered during preparation of the Specific Plan. In addition, representing a large portion of the citywide development potential, the Specific Plan Area is situated in a strategic location with excellent highway access, which is a critical locational criterion for industrial and manufacturing businesses that is lacking for many of the city's other industrial sites. Craft Consulting's preliminary analysis indicates that the city appears to have an adequate supply of land available to accommodate projected opportunities for growth in office-based employment categories.⁴ In light of these findings, the City might wish to consider redesignating some of the Specific Plan Area currently slated for office development to accommodate industrial/manufacturing development. However, this shift in land use prioritization for the Plan Area may not be compatible with the General Plan's guidance with respect to future land uses and development patterns within Priority Area 1.

CONTRIBUTION TO CITYWIDE LAND SUPPLY FOR RESIDENTIAL DEVELOPMENT

In contrast to the situation with development capacity for industrial/manufacturing uses, the City appears to have adequate residential land capacity to accommodate projected residential growth, even under a scenario that is considerably more aggressive than the growth projections published by ABAG. The land currently designated for residential development within the Specific Plan Area contributes in a meaningful way to this supply, with potential for development of 1,441 new residential units, or about 16.4 percent of the city's total residential development capacity. Although landowners and developers have expressed interest in re-designating non-residential land within Priority Area 1 for residential development, these findings indicate that the city does not face a shortage of residential development opportunities within Priority Area 1, or elsewhere within the city. At a minimum, it would be premature to redesignate non-residential land in Priority Area 1 for residential development, as this would simply create competition with owners/developers of land that is already designated for residential development, and would likely result in a re-allocation of residential absorption within the city, rather than an increase in overall change in the city's residential absorption rate, which could hamper the timely buildout of residential development projects that have been planned elsewhere in the city.

CONCLUSION

The City faces a potential shortage of development capacity to accommodate its full potential for economic development related to industrial/manufacturing activities. Land designated for industrial uses in Priority Area 1 represents a critical piece of the city's available development capacity for these uses in terms of both the quantity of development capacity and the quality of the location. Although current market pressures may encourage residential development in the short term, the City will not likely benefit from re-designating industrial land in the Specific Plan Area to allow single-family housing

⁴ Personal communication. Gary Craft, Craft Consulting, December 22, 2016.

development in the short term. Such a move might result in adverse impacts to the orderly development of other residential developments already planned within the city, which appear more than adequate to meet anticipated demand in the next several decades. At the same time, a loss of land designated for industrial development would exacerbate the potential for the City to run into a shortfall of land to accommodate economic development opportunities.

REFERENCES

BAE Urban Economics. Economic Conditions Background Report, General Plan Priority Area 1 Specific Plan, City of Brentwood. December 23, 2016.

























City of Brentwood, 2016. City of Brentwood Parks, Trails & Recreation Annual Report. 2016.

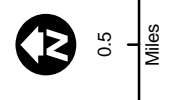
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PRIORITY AREA 1 SPECIFIC PLAN AREA

**Figure 1.1-1-1:
City of Brentwood Planning Areas
and General Plan Land Uses**

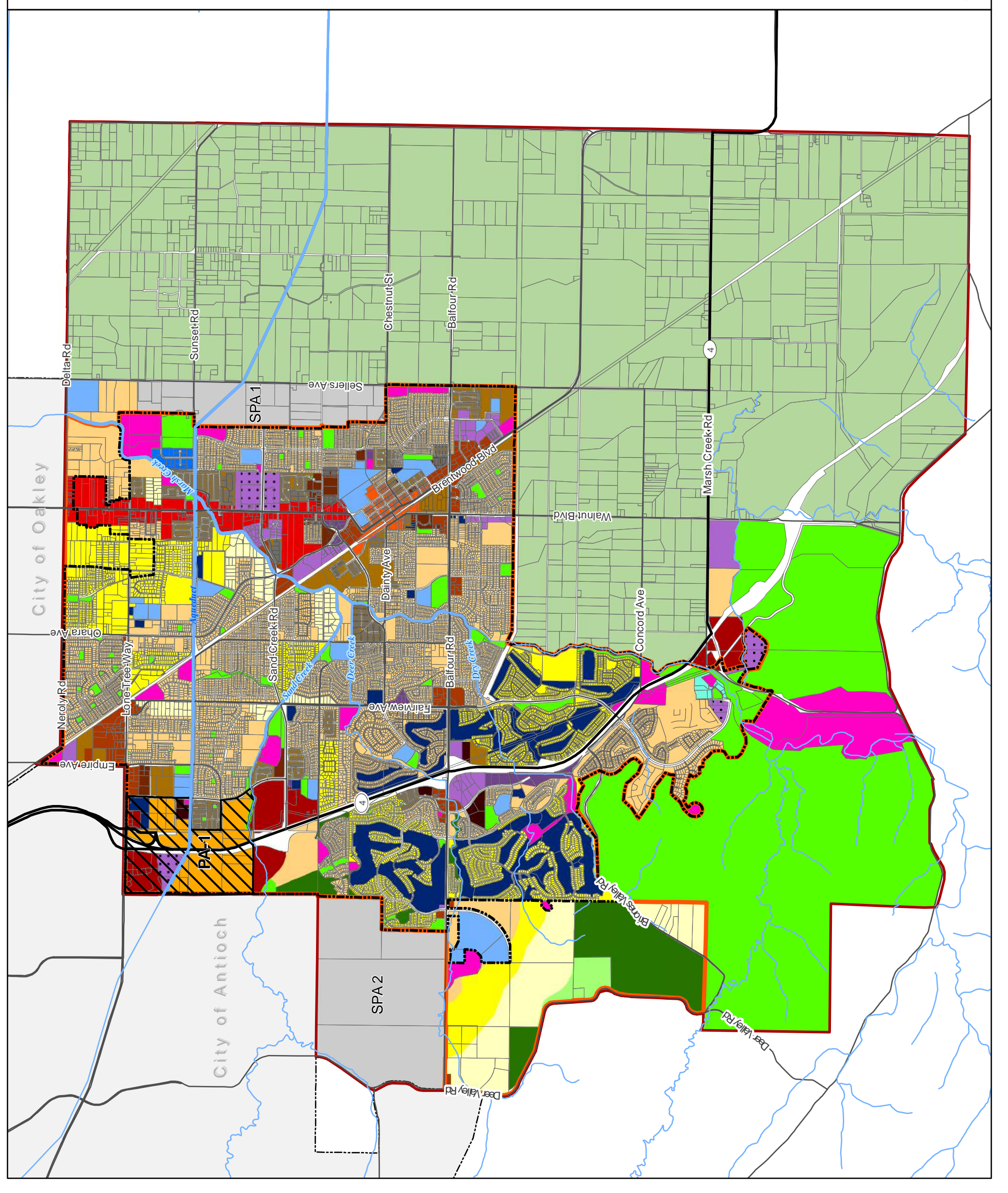
- Planning Areas**
-  Priority Area 1
 -  Brentwood City Limits
 -  Brentwood Sphere of Influence
 -  Brentwood Planning Area

- Land Use Designations**
-  DSP - Downtown Specific Plan
 -  BBSP - Brentwood Blvd Specific Plan
 -  CC - Community College
 -  I - Industrial
 -  UR - Urban Reserve
 -  AGCON - Agricultural Conservation
 -  P - Park
 -  P-OS - Permanent Open Space
 -  GC - General Commercial
 -  RC - Regional Commercial
 -  BP - Business Park
 -  PO - Professional Office
 -  PD - Planned Development
 -  PF - Public Facility
 -  SPF - Semi-Public Facility
 -  RE - Ranchette Estate
 -  R-VLD - Residential-Very Low Density
 -  R-LD - Residential-Low Density
 -  R-MD - Residential-Medium Density
 -  R-HD - Residential-High Density
 -  R-VHD - Residential-Very High Density
 -  MUPT - Mixed Use Pedestrian Transit
 -  SCH - School
 -  SPA - Special Planning Area



















1:48,000

Data sources: City of Brentwood General Plan Land Use Map, adopted July 22, 2014; ESRI StreetMap North America, Map date: October 10, 2016.



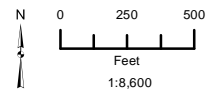


Assessed Land Uses

	Assessor Noted Vacant Lot		Rural, Residential Improved
	Single Family Residential		Rural, with or without Misc Structures
	Residential, Vacant		Urban Acreage
	Vacant Land		Orchard/Vineyard/Row Crop 10ac-40ac
	Commercial Stores		Orchard/Vineyard/Row Crop Over 40ac
	Service Stations/Car Wash		Churches
	Shopping Centers		Government Owned, with or without Buildings
	Drive-In Restaurants		Taxable Municipal-Owned

PRIORITY AREA 1 SPECIFIC PLAN

Figure 1.1-2: Assessed Land Uses



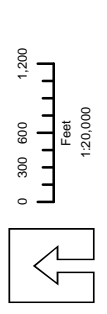
Sources: City of Brentwood parcels, 11/9/2016; Contra Costa County; OpenStreets. Map date: January 31, 2017.

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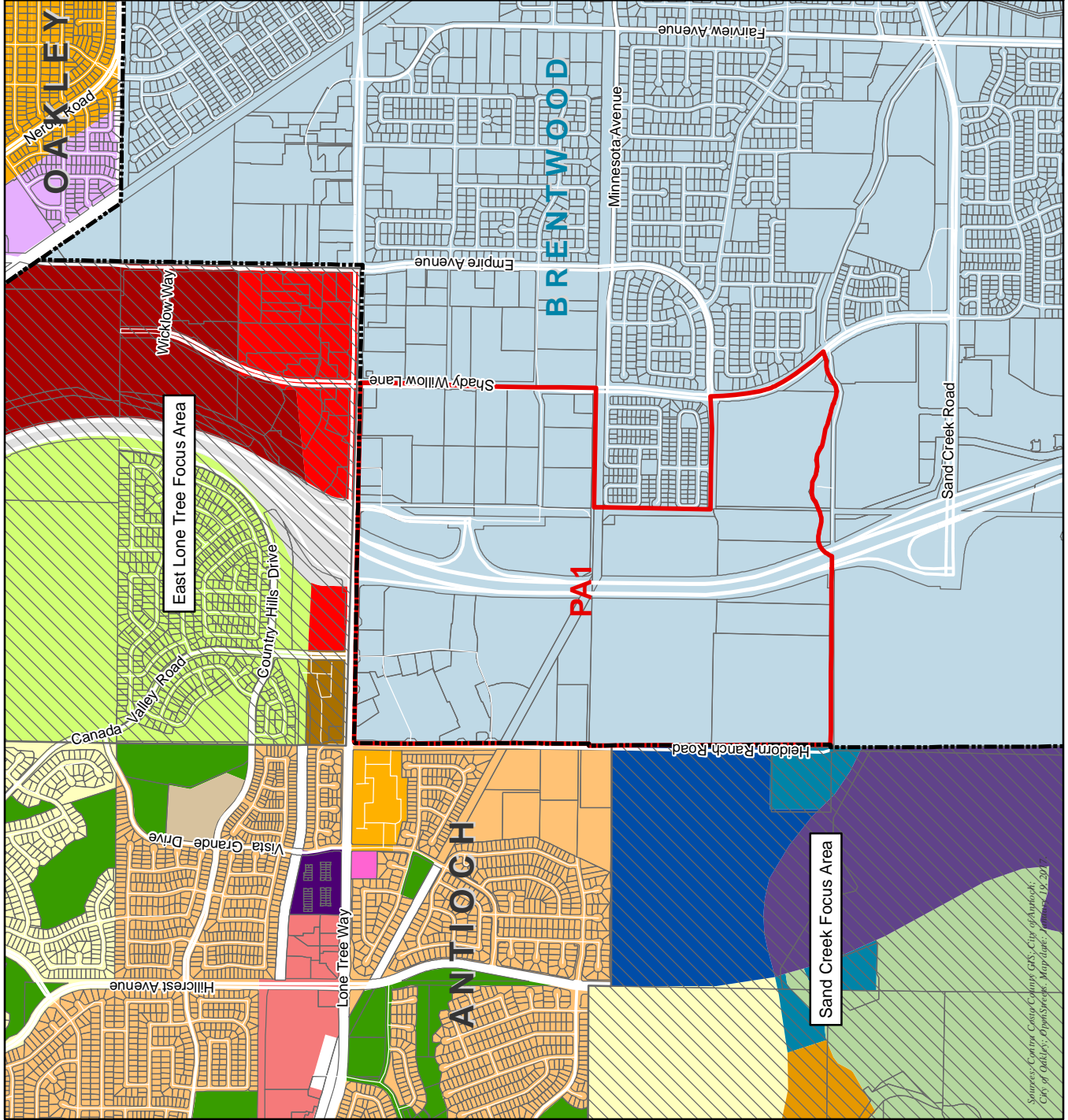
PRIORITY AREA 1 SPECIFIC PLAN

**Figure 1.1-3:
Nearby Land Uses within the
Cities of Antioch and Oakley**

- Legend**
- City Boundary
 - City of Oakley General Plan Land Uses
 - Multi-Family Low
 - Single Family Medium
 - City of Antioch General Plan Land Uses
 - Neighborhood Commercial
 - Low Density Residential
 - Medium Low Density Residential
 - High Density Residential
 - Office
 - Business Park
 - Open Space
 - Public/Institutional
 - City of Antioch Focus Areas
 - Focus Area
 - Low Density Residential
 - Multiple Family
 - High Density Residential
 - Hillside, Estate and Executive Residential/Open Space
 - Residential/Open Space
 - Open Space/Senior Housing
 - Regional Retail
 - Regional Retail/Employment-Generating Lands
 - Business Park
 - Public/Quasi Public
 - Right of Way

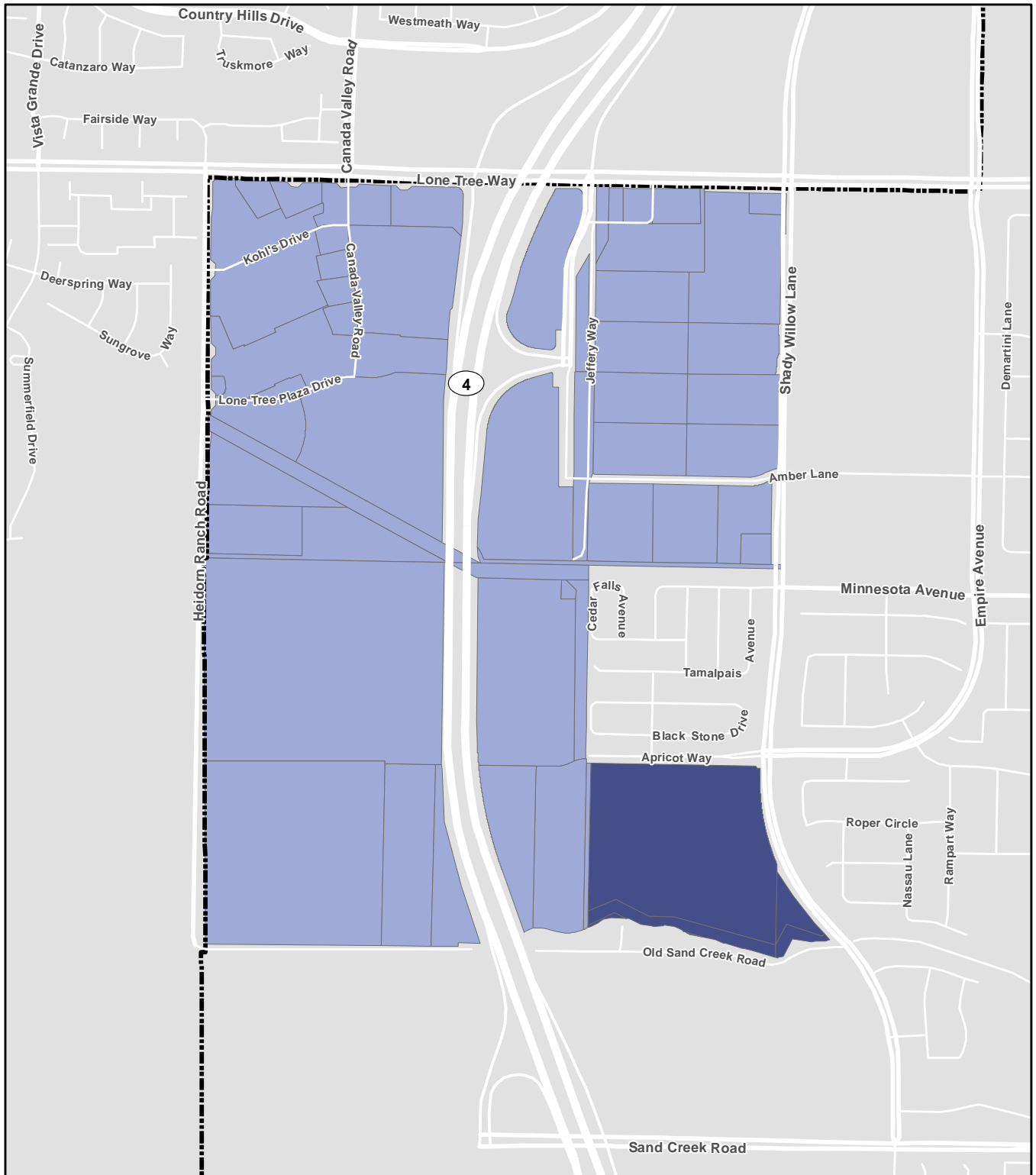


De Novo Planning Group
A Sustainable Planning, Design, and Environmental Firm



Source: Contra Costa County GIS, City of Antioch, City of Oakley, OpenStrees. Map date: January 19, 2017.


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PRIORITY AREA 1 SPECIFIC PLAN


Figure 1.3-1. City of Brentwood Tax Rate Areas by Property Tax Allocation Factor

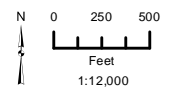
Legend

 Brentwood City Limits

Tax Increment Factor

 <10.0%

 10.1% - 13.5%



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2.0 CIRCULATION

The following section describes the existing regulatory, physical and operational characteristics affecting the transportation system within the Specific Plan Area. An overview of the circulation network's setting and regulatory framework is presented first, followed by descriptions of each transportation mode. The section concludes with an analysis of multimodal levels of service on key corridors in the city. Full-page figures are located at the end of the chapter.

REGULATORY FRAMEWORK

The City of Brentwood General Plan along with a variety of regional, State, and federal plans, legislation, and policy directives provide guidelines for the safe operation of streets and transportation facilities in Brentwood. While the City of Brentwood has primary responsibility for the maintenance and operation of local transportation facilities within the city, Brentwood staff works on a continual basis with responsible regional, State, and federal agencies including Contra Costa County, Contra Costa Transportation Authority (CCTA), Metropolitan Transportation Commission (MTC), California Department of Transportation (Caltrans), and Federal Highway Administration, as well as others, to maintain, improve, and balance the competing transportation needs of the community and the region.

STATE

State of California Complete Streets Act

On September 30, 2008, Governor Schwarzenegger signed AB 1358, the California Complete Streets Act of 2008, into law. As of January 2011, AB 1358 requires any substantive revision of the circulation element of a city or county's general plan to identify how it will safely accommodate the circulation of all users of the roadway including pedestrians, bicyclists, children, seniors, individuals with disabilities, and transit riders, as well as motorists.

Caltrans

DEPUTY DIRECTIVE 64-R1: COMPLETE STREETS – INTEGRATING THE TRANSPORTATION SYSTEM

In 2001, Caltrans adopted Deputy Directive 64; a policy directive related to non-motorized travel throughout the state. In October 2008, Deputy Directive 64 was strengthened to reflect changing priorities and challenges. DD 64-R1 states:

The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system. Providing safe mobility for all users, including motorists, bicyclists, pedestrians and transit riders, contributes to the Department's mission/vision: "Improving Mobility across California."

Successful long-term implementation of this policy is intended to result in more options for people to go from one place to another, less traffic congestion and greenhouse gas emissions, more walkable communities (with healthier, more active people), and fewer barriers for older adults, children, and people with disabilities.

2.0 CIRCULATION

Economically, complete streets can help revitalize communities, and they can give families the option to lower transportation costs by using transit, walking, or bicycling rather than driving to reach their destinations. Caltrans is actively engaged in implementing its complete streets policy in all planning, programming, design, construction, operations, and maintenance activities and products on the State Highway System.

DIRECTOR'S POLICY 22 (DP-22): DIRECTOR'S POLICY ON CONTEXT SENSITIVE SOLUTIONS

Director's Policy 22, a policy regarding the use of "Context Sensitive Solutions" on all State highways, was adopted by Caltrans in November of 2001. The policy reads:

The Department uses "Context Sensitive Solutions" as an approach to plan, design, construct, maintain, and operate its transportation system. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. Context sensitive solutions are reached through a collaborative, interdisciplinary approach involving all stakeholders.

The context of all projects and activities is a key factor in reaching decisions. It is considered for all State transportation and support facilities when defining, developing, and evaluating options. When considering the context, issues such as funding feasibility, maintenance feasibility, traffic demand, impact on alternate routes, impact on safety, and relevant laws, rules, and regulations must be addressed.

The policy recognizes that "in towns and cities across California, the State highway may be the only through street or may function as a local street," that "these communities desire that their main street be an economic, social, and cultural asset as well as provide for the safe and efficient movement of people and goods," and that "communities want transportation projects to provide opportunities for enhanced non-motorized travel and visual quality." The policy acknowledges that addressing these needs will assure that transportation solutions meet more than just traffic and operational objectives.

CALIFORNIA TRANSPORTATION PLAN SOLUTIONS

In June 2016, Caltrans published their California Transportation Plan (CTP) 2040. The document states that, "The CTP 2040 outlines goals and recommendations to achieve a vision for safe, sustainable, universally accessible, and globally competitive transportation system that provides reliable and efficient mobility for people, goods, and services, and information, while meeting State GHG emission reduction goals and preserving the unique character of California's communities." The CTP has outlined the following six goals; several key policies relevant to the Specific Plan are also noted.

Goal 1: Improve Multimodal Mobility and Accessibility for All people

Policy 1: Manage and Operate an Efficient Integrated System

Policy 1: Support Transportation Choice to Enhance Economic Activity

Goal 2: Preserve the Multimodal Transportation System

Policy 2: Support Transportation Choices to Enhance Economic Activity

Goal 3: Support a Vibrant Economy

Policy 3: Provide Viable and Equitable Multimodal Choices Including Active Transportation

Goal 4: Improve Public Safety and Security

Goal 5: Foster Livable and Healthy Communities and Promote Social Equity

Goal 6: Practice Environmental Stewardship*LOCAL***Contra Costa Transportation Authority**

The CCTA acts as the countywide planning and programming agency for transportation related issues in Contra Costa County. CCTA plays a leading role in transportation by managing the County's transportation sales tax program (Measure J), securing transportation funds, providing project oversight, and initiating long term planning activities. CCTA also maintains the regional transportation demand model, which contains a full database of existing and future land use projections as well as current and planned circulation networks.

Every two years CCTA updates the Congestion Management Plan (CMP), which:

- Sets standards for and assesses performance of the countywide circulation system,
- Establishes a list of prioritized capital improvements needed to maintain performance of the circulation network over the next seven years,
- Determines the process for evaluating land use decisions and their impacts to the regional roadway system,
- Provides a travel demand element that promotes circulation by modes other than single-occupant vehicles, and
- Establishes the countywide circulation improvements to be incorporated into MTC's Regional Transportation Improvement Program.

CCTA is overseeing the TriLink study, which is examining long-range regional circulation needs between the counties of Contra Costa and San Joaquin. A future highway designated SR 239 is legislatively approved between Brentwood and Tracy, though initial planning for the route has only just begun. Studies are currently focusing on the potential benefits to circulation and freight movement as well as potential alignments for the route. The City of Brentwood is an active partner in the TriLink project, which includes broad multi-jurisdictional participation from three counties, nine communities, and 11 public agencies.

Measure J

Measure J was passed by Contra Costa County voters in November 2004, assessing a half-cent sales tax on purchases made throughout the County to provide direct funding for transportation projects. Measure J also includes a growth management program that assists local and regional agencies in planning for growth, facilitating cooperation among jurisdictions and creating a regional mitigation fee program. The document *Measure J: Contra Costa's Transportation Sales Tax Expenditure Plan*, CCTA, identifies specific programs and projects affecting Brentwood, including major infrastructure improvements such as the SR 4 bypass, safety and capacity improvements on major streets, local street maintenance and improvements, TLC grants, and new facilities for pedestrians and bicyclists.

The *Draft Final East County Action Plan for Routes of Regional Significance*, CCTA, 2014 (referred to herein as the East County Action Plan), defines the performance criteria to be applied on designated routes of regional significance in and surrounding Brentwood. The East County Action Plan also establishes the East Contra Costa Regional Fee and Finance Authority (ECCRFFA), a regional impact fee program established to mitigate cumulative impacts to the region's circulation system. Measure J

requires all jurisdictions to participate in the ECCRFFA fee program in order to be consistent with the East County Action Plan. The TRANSPLAN Committee oversees regional transportation interests in Eastern Contra Costa County, overseeing compliance with the East County Action Plan and coordination with the ECCRFFA.

2016/17 – 2020/21 Capital Improvement Program

The Brentwood Capital Improvement Program (CIP) document contains a list of infrastructure projects that the City intends to implement in the next several years through use of various funding sources including impact fees and State/Federal funding. CIP projects in and surrounding the Specific Plan Area include:

- Lone Tree Way – Union Pacific Railroad Undercrossing
- CCWD Trail – construction of an off-street bicycle and pedestrian path between Empire Avenue and Grant Street, parallel to the east side of SR 4
- Trail Expansions and Improvements – construction of trails and associated amenities throughout the City; several specific projects are identified, including improvements to the Mokelumne Aqueduct Trail west of Shady Willow Trail
- Citywide programs that may result in minor Plan-area improvements – traffic signal interconnect, sidewalk replacement, pavement management, signing, striping, and signal modifications and upgrades, trail pavement management

In addition, the CIP includes a list of Development Improvements that provide a community benefit and will eventually be dedicated to the City, and will be constructed by a developer in conjunction with the development project's site improvements.

- Amber Lane Improvements (Phase II) – extend as a local street from Shady Willow Lane to Jeffery Way
- Empire Avenue Extension South – extend as a collector street including bike lanes from Shady Willow Lane to the eastern SR 4 right-of-way
- Heidorn Ranch Road (Phase II) – extend as an arterial street with bike lanes from the EBMUD aqueduct to the Sand Creek Road extension west of SR 4
- Sand Creek Road Extension – extend as an arterial street with bike lanes from the existing terminus of Sand Creek Road (near SR 4) to Heidorn Ranch Road
- Shady Willow Lane Extension (Phase II) – widen to a four-lane arterial street with bike lanes between Empire Avenue and the Sand Creek bridge
- Shady Willow Lane Widening and Signal – widen to a four-lane arterial street with bike lanes between Arbor Ridge apartments and Amber Lane, including installation of a traffic signal at the Amber Lane intersection

Metropolitan Transportation Commission

The current Regional Transportation Plan (RTP) produced by MTC, *Transportation 2035 Plan*, was finalized in February 2009 and updates the previous 2005 RTP. The 2035 Plan sets forth regional transportation policy and provides capital program planning for all regional, State, and federally funded projects. In addition, the 2035 Plan provides strategic investment recommendations to improve regional transportation system performance over the next 25 years. Investments in regional highway, transit, local roadway, bicycle, and pedestrian projects are set forth. These projects have been identified through regional and local transportation planning processes, and in Contra Costa County include those projects listed in the CCTA's Congestion Management Program. Project recommendations

are premised upon factors related to existing infrastructure maintenance, increased transportation system efficiencies, improved traffic and transit operations, and strategic expansions of the regional transportation system.

Parks, Trails and Recreation Master Plan

In 2002, the City of Brentwood approved the *Brentwood Parks, Trails and Recreation Master Plan*. The Plan established city-wide goals and policies related to recreational facilities, which includes bicycle and pedestrian facilities. In general, the plan focuses on off-street, mixed-use facilities with some additional policies for on-street facilities. One of the goals of the Master Plan is to guide the creation of a citywide network of trails to meet the needs of residents for recreation, commuting, and alternative transportation. The Plan calls for the network to connect to key destinations throughout the city, such as parks, schools, shopping centers, employment centers, and Downtown, including a proposed “Safe Trails to Schools” program. These City trails are supplemented by trails operated by the East Bay Regional Parks District (EBRPD).

Through a collaborative planning process, a vision, goals, and objectives were developed for the trail network in Brentwood. The plans are designed to guide the development and maintenance of bicycle and pedestrian facilities, to enhance non-motorized mobility, reduce traffic congestion, and improve safety, access, air quality, and the quality of life.

Within the Specific Plan Area, the Parks, Trails and Recreation Master Plan includes plans to extend the Mokelumne Coast trail. The trail currently runs from Sellers Avenue to just east of SR 4, a distance of approximately 3.5 miles. The trail continues west of SR 4, from Heidorn Ranch Road to Hillcrest Avenue. The Parks, Trails and Recreation Master Plan includes connection of these two trail segments through the Specific Plan Area and over SR 4. An update to the Parks, Trails and Recreation Master Plan is underway and is expected to be complete in mid-2018.

Countywide Bicycle and Pedestrian Plan

In 2009, the CCTA updated the *Countywide Bicycle and Pedestrian Plan*. While the CCTA does not directly build, operate, or maintain bicycle or pedestrian facilities, it does allocate State and federal funds to be used for these purposes. Therefore, the Plan serves as a guide for prioritizing funding throughout the County. Funding for pedestrian facilities is prioritized for pedestrian-oriented districts, routes to transit, and routes to other key activity centers.

Through the original 2003 Plan, then revised in 2009, the CCTA established a Countywide Bicycle Network (CBN) which consists of approximately “246 miles of off-street bikeways and 230 miles of on-street ones in Contra Costa, with an additional 470 miles of planned or proposed bikeways.” In general the plan focuses on bikeways that serve as regional connections throughout the County and adjacent counties. Funding is prioritized for facilities identified in this plan.

Since the completion of the plan, additional facilities have been proposed and/or constructed, as listed adjacent to the map. CCTA is currently in the process of updating the maps of existing and planned pedestrian and bicycle facilities.

City of Brentwood General Plan

The following excerpts from the 2014 General Plan’s goals, policies, and actions are particularly relevant to circulation in Brentwood:

Circulation Element

Goal CIR 1: Provide a transportation system that facilitates the 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 CIR 1-1: Ensure that the City’s circulation network is maintained and improved over time to support buildout of the General Plan in a manner that is consistent with the General Plan Roadways Map.

Policy CIR 1-2: Ensure that the City’s circulation network is a well-connected system of streets, roads, highways, sidewalks, and paths that effectively accommodates vehicular and non-vehicular traffic in a manner that considers the context of surrounding land uses and the needs of all roadway users.

Policy CIR 1-3: When analyzing impacts to the circulation network created by new development or roadway improvements, consider the needs of all users, including those with disabilities, ensuring that pedestrians, bicyclists, and transit riders are considered at an equal level to automobile drivers.

Policy CIR 1-4: Maintain the Multimodal Transportation Service Objective (MTSO) standards set forth for designated regional transportation facilities that pass through Brentwood, as identified in the East County Action Plan for Routes of Regional Significance, produced by the TRANSPLAN Committee and Contra Costa Transportation Authority (CCTA).

- Following are the Routes of Regional Significance identified within and surrounding Brentwood by the East County Action Plan for Routes of Regional Significance.
 - State Route (SR) 4
 - Balfour Road
 - Brentwood Boulevard
 - Deer Valley Road
 - Fairview Avenue
 - Sand Creek Road
 - Lone Tree Way
 - Oak St-Walnut Blvd
 - Marsh Creek Road
 - Vasco Road
- Freeway MTSO – The Delay Index should not exceed 2.5 during the peak hour. This applies to SR 4 freeway segments.
- Signalized Suburban Arterial Routes – Intersection levels of service should be maintained at LOS D or better.
- Non-Signalized Rural Roads – Roadway levels of service should be maintained at LOS D or better.

Policy CIR 1-5: Maintain LOS D or better operation at intersections within Brentwood that are not on designated Routes of Regional Significance, and LOS E or better operation at intersections in the Downtown Specific Plan area.

Policy CIR 1-6: Intersections may be exempted from the LOS standards established in Policy CIR 1-5 in cases where the City Council finds that the infrastructure improvements needed to maintain vehicle LOS (such as roadway or intersection widening) would be in conflict with goals of improving multimodal circulation, or would lead to other potentially adverse environmental impacts. For those locations where the City allows a reduced motor vehicle LOS or queuing standard, additional multimodal improvements may be required in order to reduce impacts to mobility.

Policy CIR 1-7: Improve circulation in locations with high levels of congestion, but avoid major increases in street capacities unless necessary to remedy severe traffic congestion on major arterial corridors.

Policy CIR 1-8: Consider all transportation improvements as opportunities to improve safety, access, and mobility for all roadway users.

Policy CIR 1-9: Provide high quality regular maintenance for existing and future transportation facilities including streets, sidewalks, and paths.

Policy CIR 1-10: Maximize the use of matching funding grant sources to provide ongoing maintenance, operation, and management of the City's circulation network.

Policy CIR 1-11: Consider roundabouts in lieu of traffic signals where appropriate conditions exist to maximize intersection efficiency, maintain continuous but moderate traffic flow, reduce accident severity, and enhance pedestrian and cyclist circulation.

Policy CIR 1-12: Maintain and improve critical transportation facilities for emergency vehicle access and emergency evacuation needs.

Policy CIR 1-13: Maintain a transportation system, consistent with the City Truck Routes Map, which provides truck mobility to serve Brentwood commerce, and supports infrastructure improvements to separate regional goods movement from local circulation.

Policy CIR 1-14: Work with the California Public Utilities Commission (CPUC) in evaluating the potential to create additional grade separated roadway crossings on the Union Pacific Railroad (UPRR) line through Brentwood.

Policy CIR 1-16: Work with major employers and higher-education institutions to implement Transportation Demand Management (TDM) programs.

Policy CIR 1-18: Consider the impacts of growth in surrounding jurisdictions when designing Brentwood's circulation network, and in particular, the impacts created on the Sellers Avenue corridor by growth in Oakley.

Policy CIR 1-19: Participate in regional planning efforts for the future SR 239 highway corridor between Brentwood and Interstates 580/205 in Tracy, recognizing that the importance of the route may increase over time as patterns in regional employment and commerce change.

ACTION CIR 1a: The City shall cooperate with other jurisdictions in Contra Costa County to reduce transportation congestion through the following actions:

1. Participate in the Contra Costa Transportation Authority's Growth Management and Congestion Management Programs.

2.0 CIRCULATION

2. Continue to serve on the TRANSPLAN Committee.
3. Encourage public input into the congestion management planning process.
4. Participate in future updates to the East County Action Plan for Routes of Regional Significance.
5. Cooperate with CCTA and other jurisdictions in planning for intersections subject to Findings of Special Circumstance.
6. Coordinate with neighboring agencies in efforts to expand regional bicycle, pedestrian, and equestrian networks to meet anticipated demands.

ACTION CIR 1b: Complete the following roadway improvements to maintain the safety and efficiency of the current circulation system, and to support buildout of the General Plan.

1. BUILDOUT TO CITY LIMITS
 - a) Lone Tree Way/SR 4 South Ramps – Reallocate eastbound lanes to two through lanes and two right-turn lanes.
 - b) Lone Tree Way/O’Hara Avenue – Widen the westbound approach to include a shared through/right-turn lane. Modify the signal to include a right-turn overlap phase on the eastbound approach.
 - c) Lone Tree Way/Brentwood Boulevard – Modify signal to provide protected left-turns on the east and west legs. Eastbound: modify to provide left-turn, through, and right-turn lanes, and implement right-turn overlap signal phasing. Westbound: modify to provide a left-turn lane, through lane, and shared through/right-turn lane. Northbound: modify to provide dual left-turn, single through, and single through/right-turn lanes.
 - d) Brentwood Boulevard/Grant Street – Modify signal to protected left-turn movements on the east and west legs. Eastbound: modify to provide one left-turn lane and one shared through/right-turn lane. Westbound: widen to provide single left-turn, through, and right-turn lanes.
 - e) Sand Creek Road/Fairview Avenue – Widen the northbound approach to add a left-turn lane. Reconfigure the southbound approach to include left-turn, through, and shared through/right-turn lanes.
 - f) Fairview Avenue/San Jose Avenue – Reconfigure east and west approaches to include single left-turn and single through/right-turn lanes. Modify signal to protected left-turn phasing on the east and west legs.
 - g) Balfour Road/Brentwood Boulevard – Widen to provide an additional northbound left-turn lane and westbound right-turn lane.
 - h) Walnut Boulevard between Armstrong Road and Vasco Road – Widen to two lanes in each direction.
2. BUILDOUT TO THE PLANNING AREA (improvements in addition to those listed above)
 - a) Lone Tree Way/Fairview Avenue – Modify signal to provide protected left-turn phasing on the north and south legs.
 - b) Lone Tree Way/Brentwood Boulevard – Same improvements as identified above, plus widen the eastbound approach to include a second right-turn lane.
 - c) Brentwood Boulevard/Grant Street – same improvements as identified above, plus widen the westbound and southbound approaches to include dual left-turn lanes. Widen the northbound approach to add a right-turn lane. Widen Sunset Road east of the intersection to provide two eastbound lanes, approximately to McHenry Lane.

- d) Sand Creek Road/SR 4 North – Add a second northbound right-turn lane.
- e) Sand Creek Road/O'Hara Avenue – Modify signal to provide right-turn overlap phases on the eastbound and westbound approaches.
- f) Balfour Road/Deer Valley Road – Signalize intersection and widen to provide a southbound left-turn pocket.
- g) Balfour Road/American Avenue – Widen to provide a westbound right-turn lane.
- h) Balfour Road/Fairview Avenue – Reconfigure northbound approach to include dual left-turn, single through, and shared through/right-turn lanes.
- i) Balfour Road/Walnut Boulevard – Modify signal to provide an eastbound right-turn overlap phase.
- j) Balfour Road/Brentwood Boulevard – Same improvements as identified above, plus widen the eastbound approach to provide two left-turn lanes, a through lane and a right-turn lane.

The City Traffic Engineer may substitute one or more of the improvements listed above with other improvements deemed to achieve acceptable operation.

ACTION CIR 1c: The Public Works Department shall maintain a systematic pavement management program and identify and prioritize maintenance projects in the City's CIP.

1. Street maintenance should include upkeep and regular cleaning of bicycle routes to remove debris and repair poor pavement conditions that discourage bicycle riding
2. The Pavement Management Program data system should address signage and pavement quality throughout the city

ACTION CIR 1d: As part of the development review process, the Community Development Department and the Public Works Department shall review development projects to ensure that developers:

1. Construct transportation improvements along property frontages when appropriate
2. Address the project's proportional-share of impacts to the City's circulation network through payment of traffic mitigation and other fees
3. Provide for complete streets to the extent feasible, facilitating walking, biking, and transit modes
4. Fund traffic impact studies that identify on-site and off-site project effects and mitigation measures
5. Provide adequate emergency vehicle access

ACTION CIR 1e: Update the City's Capital Improvement Program (CIP) to include, as appropriate, the roadway improvements necessary to support buildout of the General Plan.

ACTION CIR 1g: Provide staff support to regional agencies such as CCTA and Caltrans in the implementation of ITS measures that improve the efficiency of roadway and transit networks in east Contra Costa County.

ACTION CIR 1h: Ensure regular monitoring of traffic accidents, traffic levels, and intersection capacity to update base data and respond to safety problems and changing conditions. Prioritize locations with high collision rates for safety improvements.

2.0 CIRCULATION

ACTION CIR 1i: Continually seek opportunities to fund maintenance of and improvements to the circulation network, including the active pursuit by the Public Works Department of a wide range of grant sources overseen by MTC and other agencies.

GOAL CIR-2: Proactively support and encourage travel by non-automobile modes by maintaining and expanding safe and efficient pedestrian, bicycle, equestrian, and transit networks

Policy CIR 2-1: Establish and maintain a system of interconnected bicycle, pedestrian, and equestrian facilities that facilitate commuter and recreational travel, and that are consistent with the City's parks, trails, and recreation goals and policies in this General Plan and the Contra Costa County Countywide Bicycle and Pedestrian Plan.

Policy CIR 2-2: Routinely incorporate sidewalks and enhanced pedestrian crossing facilities as part of new street construction, and incorporate bicycle facilities on new collector and arterial streets (including bicycle lanes where appropriate, bicycle route and destination signs, and bicycle detection at signals).

Policy CIR 2-3: Require development projects to construct on-site sidewalks, paths, and trails in a manner that is consistent with the City's parks, trails, and recreation goals and policies in this General Plan and the Contra Costa County Countywide Bicycle and Pedestrian Plan, and as dictated by the location of transit stops and common pedestrian destinations.

Policy CIR 2-4: Create an accessible circulation network that is consistent with guidelines established by the Americans with Disabilities Act (ADA), allowing mobility-impaired users such as the disabled and elderly to safely and effectively travel within and beyond the city.

Policy CIR 2-6: Prioritize bicycle and pedestrian safety for students traveling to and from school.

Policy CIR 2-7: Support regional efforts to develop Safe Routes to School Programs for schools that serve Brentwood's population.

Policy CIR 2-8: Provide secure bicycle racks in places such as the Downtown, at commercial areas, park and ride transit facilities, schools, multiple unit residential developments, and other locations where there is a concentration of residents, visitors, students, or employees.

Policy CIR 2-9: Where possible, integrate multi-use path facilities into utility corridor rights-of-way.

Policy CIR 2-10: Work with utility providers to reduce or eliminate barriers to pedestrian and bicyclist mobility created by utility infrastructure (such as utility poles that obstruct accessibility).

Policy CIR 2-11: Design safe crossings where trails and roads meet.

Policy CIR 2-12: Seek opportunities to fund and construct improvements that improve multimodal access to any future mass transit facility (i.e., eBART).

Policy CIR 2-13: Coordinate with Tri Delta Transit to increase the coverage areas and frequencies of bus service in Brentwood.

Policy CIR 2-14: Ensure that effective linkages are in place between any future mass transit facility (i.e., eBART) and the city's primary activity and employment centers.

Policy CIR 2-15: Coordinate with Tri Delta Transit to maintain existing and, where feasible, build new lighted and sheltered seating facilities at bus stops.

Policy CIR 2-16: Ensure that adequate lighting and trash disposal is provided at all bus stops.

Policy CIR 2-17: Encourage the use of park-and-ride lots and other transit incentives for Brentwood commuters.

Policy CIR 2-18: Work with Tri Delta Transit to identify the need for and locations of additional park-and-ride lots in Brentwood in order to increase the number and length of trips made by transit and carpooling.

Policy CIR 2-19: Provide safe and continuous pedestrian, vehicular, and bicycle access at all transit park-and-ride facilities.

ACTION CIR 2a: Review development applications to ensure compliance with the parks, trails, and recreation goals and policies in this General Plan and the Countywide Bicycle and Pedestrian Plan.

ACTION CIR 2b: Review traffic signal timing plans to ensure adequate crossing times for all users at signalized intersections.

ACTION CIR 2c: Review all transportation improvements to ensure installation in accordance with current accessibility standards.

ACTION CIR 2e: Continue to include construction of bicycle and pathway facilities in the City's Capital Improvement Program, prioritizing areas where gaps in the current network need to be filled.

ACTION CIR 2f: Ensure that bicycle loop detectors are present at traffic signals and clearly identified with stencils.

ACTION CIR 2g: Assist and coordinate with Tri Delta Transit in seeking funding to increase transit frequencies on key corridors, increase the hours of transit operation, and expand regular transit service in portions of Brentwood that have no public transit service.

1. New or modified routes that connect the Downtown area with major employment centers and Los Medanos College should be prioritized.
2. New or modified routes connecting residential and employment-based uses to any future mass transit facility (i.e., eBART) should be coordinated to initiate with implementation of rail service.

ACTION CIR 2i: Monitor national efforts to establish effective multimodal level of service standards for pedestrian, bicycle, and transit modes.

ACTION CIR 2j: Issue guidelines and incorporate assessment of multimodal LOS as a routine component of transportation impact analyses once the Public Works Department determines a multimodal LOS methodology that is deemed suitable for application in Brentwood.

GOAL CIR-3: Coordinate circulation facilities with land use and development patterns to create an environment that encourages walking, bicycling, and transit use.

Policy CIR 3-1: Recognize the role of streets not only as vehicle routes but also as parts of a system of public spaces, with quality landscaping, street trees, and bicycle and pedestrian paths.

Policy CIR 3-2: Prioritize high-density and mixed land use patterns that promote transit and pedestrian travel along transit corridors.

Policy CIR 3-3: Design developments to include features that encourage walking, bicycling, and transit use. Design features shall include bus turnouts, transit shelters and benches, and pedestrian access points between subdivisions and between adjacent related land uses.

Policy CIR 3-4: Provide an interconnected street network that provides multiple points of access, discouraging cut-through traffic while maintaining neighborhood connectivity.

Policy CIR 3-6: Ensure that the City's adopted street standards reflect a multi-modal focus, including vehicular lane widths that are no wider than necessary to serve the surrounding land use context and accommodate emergency vehicles.

Policy CIR 3-9: Design intersections to provide adequate and safe access for all users including pedestrians, bicyclists, and motorists of all ages and abilities.

Policy CIR 3-10: Require new development to include effective linkages to the surrounding circulation system for all modes of travel, to the extent feasible.

ACTION CIR 3a: During the development review process, the Community Development Department shall review plans to ensure that projects include an interconnected network of streets and paths that facilitate non-auto modes for shorter trips, and disperse rather than concentrate traffic in residential neighborhoods.

ACTION CIR 3b: The Public Works Department shall review plans for new or modified intersections to ensure that the number of vehicle lanes is limited where possible to provide for moderate speeds and pedestrian and bicyclist safety, and that curb extensions are installed where appropriate to reduce driving speeds and shorten pedestrian crossing distances.

ACTION CIR 3c: The Public Works Department shall review its adopted street standards and update them as necessary to achieve balanced roadway configurations that serve all users, and through design help to reinforce appropriate vehicle speeds for the surrounding land use context.

GOAL CIR-4: Ensure that a combination of managed growth and adequate funding mechanisms are in place to complete future improvements on the local and regional circulation networks

Policy CIR 4-1: Ensure that the rate of growth in Brentwood is consistent with the ability to provide adequate transportation services.

Policy CIR 4-2: Require new development to contribute its proportional cost of circulation improvements necessary to address cumulative transportation impacts on roadways throughout the city, as well as the bicycle and pedestrian network.

Policy CIR 4-3: Include capital projects sponsored by the City and necessary to maintain and improve traffic operations in the five-year Capital Improvement Program (CIP) that is annually

reviewed by the City Council. Funding sources for such projects as well as intended project phasing will be generally identified in the CIP.

Policy CIR 4-4: Consider funding transportation projects intended to meet or maintain Level of Service standards, to implement the East County Action Plan for Routes of Regional Significance, and to provide mitigation for intersections subject to Findings of Special Circumstances through use of Local Road Improvement and Maintenance Funds allocated by the Contra Costa Transportation Authority. In no case will revenue from this source replace private developer funding for transportation projects determined to be required for new development to meet or maintain existing standards.

Policy CIR 4-5: Consider amendments to the City's General Plan, Zoning Ordinance, Capital Improvement Program, or other relevant documents to ensure that the East County Action Plan for Routes of Regional Significance is implemented and standards on non-regional routes are met.

ACTION CIR 4a: Maintain and routinely update the City's Development Fee Program to cover the cost of mitigating development's share of improvements on non-regional and regional routes, as well as the cost of maintaining Brentwood's identified service and/or performance standards.

ACTION CIR 4b: As part of the development review process, require new development to mitigate circulation impacts by making improvements to the motorized and non-motorized circulation networks as necessary, and in a proportional manner with an established nexus between the level of impact and required improvements and/or contributions.

ACTION CIR 4c: Implement specified local actions for the City of Brentwood as identified in the East County Action Plan for Routes of Regional Significance in a timely manner.

EXISTING SETTING

The city of Brentwood lies on the outskirts of the East Bay within Contra Costa County. SR 4 connects Brentwood to Concord, located approximately 25 miles to the west. To the northwest, SR 160 connects Brentwood to the Sacramento area, and to the south, Vasco Road connects Brentwood to Livermore and the Tri-Valley region. SR 4 extends eastward from Brentwood connecting to Stockton and the Interstate 5 corridor through the Central Valley.

The Specific Plan Area is located in the northwest corner of the city, bordering the Antioch city limits. SR 4 runs through the approximate center of the Specific Plan Area. In the past several years, the SR 4 freeway has been extended into Brentwood with grade-separated interchanges at Lone Tree Way and Sand Creek Road, continuing to the south of Sand Creek Road as an at-grade expressway connecting to Vasco Road. To the west through the communities of Antioch and Pittsburg, SR 4 has also been upgraded in the past several years to alleviate regional congestion.

Travel Characteristics

CENSUS JOURNEY TO WORK

Data from the 2010 US Census and 2010-2014 American Community Survey (ACS) were utilized to illustrate Journey to Work statistics for Brentwood. According to the 2010 Census, Brentwood’s total population was about 51,500 people, including nearly 20,000 workers 16 years of age or older. Of these workers, nearly 19,000 worked outside the home. The 2010-2014 ACS reports that the vast majority of people living in Brentwood, or approximately 77 percent of workers, drive to work alone. Alternative modes of transportation accounted for 15 percent of commute trips with approximately 11 percent of workers in carpools, three percent of commuters riding public transit, 0.5 percent of commuters walking to work; 0.1 percent bicycling to work; and the remaining one percent of commuters using other means of transportation. The remaining nine percent of workers worked at home. Table 2.0-1 provides an overview of Brentwood’s journey to work mode split data. For informational purposes, countywide statistics for Contra Costa County and the State of California are also shown.

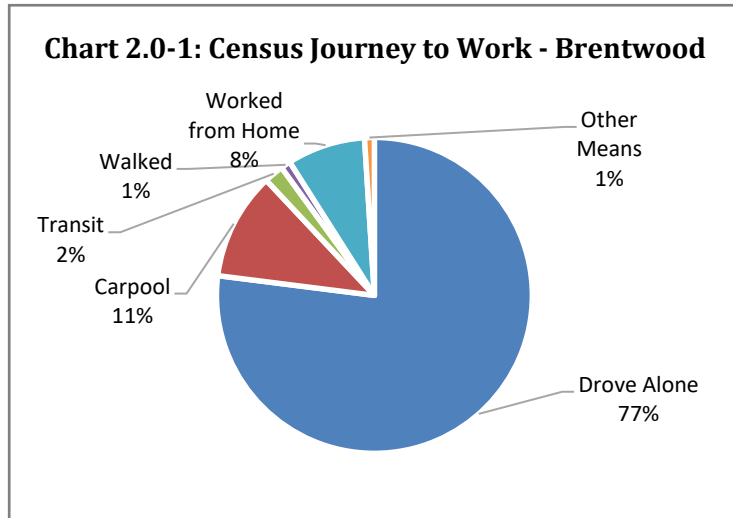


TABLE 2.0-1: DEMOGRAPHIC AND JOURNEY TO WORK DATA

	BRENTWOOD ²		CONTRA COSTA COUNTY ³		CALIFORNIA ³	
Population	51,481 ¹		1,049,025 ¹		37,253,956 ¹	
Employed persons	19,729		463,732		15,921,475	
MODE SPLIT	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
Drove Alone	17,637	76.6%	321,362	69.3%	11,650,145	73.2%
Bike	22	0.1%	N/A	N/A	N/A	N/A
Walk	120	0.5%	6,432	1.4%	429,786	2.7%
Public Transit	582	2.5%	40,951	8.8%	820,349	5.1%
Carpool	2,474	10.8%	58,108	12.5%	1,831,538	11.5%
Motorcycle	14	0.1%	N/A	N/A	N/A	N/A
Other	242	1.1%	8,134	1.8%	365,352	2.3%
Worked at Home	1,955	8.5%	28,745	6.2%	824,305	5.2%

NOTES:

¹POPULATION DATA OBTAINED FROM 2010 CENSUS

²BRENTWOOD MODAL CHOICE DATA OBTAINED FROM 2010-2014 AMERICAN COMMUNITY SURVEY

³COUNTY AND STATE MODAL CHOICE DATA OBTAINED FROM 2010 ACS 1-YEAR ESTIMATES

SOURCE: W-TRANS, 2016.

Additionally, ACS data indicate that the average commute time in the Bay Area is 30 minutes. Brentwood has the second highest regional commute time with an average commute time of 40.8 minutes.

Auto Ownership

According to the 2010-2014 ACS, approximately two percent of Brentwood’s households have no vehicle, compared to the 2009 National Household Travel Survey (NHTS) which reported that 8.7 percent of American households and 7.7 percent of California households do not have a vehicle. This is

relevant in that the US Department of Transportation has found that “the amount of travel people do and the way they travel is strongly related to the availability of personal vehicles in their household.” The ACS also found that about 74 percent of Brentwood households in 2010 had at least two vehicles; much higher than the state average of about 60 percent. Vehicle ownership statistics for Brentwood from the 2008-2010 ACS are shown in Table 2.0-2.

TABLE 2.0-2: BRENTWOOD VEHICLE OWNERSHIP BY HOUSEHOLD SIZE

NUMBER OF VEHICLES IN HOUSEHOLD	1-PERSON HOUSEHOLD (2,651 TOTAL)	2-PERSON HOUSEHOLD (5,2771 TOTAL)	HOUSEHOLDS WITH 3 OR MORE PERSONS (9,210 TOTAL)
No vehicle available	11	<1%	0%
1 vehicle available	71%	22%	1%
2 vehicles available	15%	56%	41%
3 vehicles available	1%	15%	31%
4 vehicles available	<1%	5%	12%

NOTE: DATA OBTAINED FROM 2010-2014 ACS 3-YEAR ESTIMATES

SOURCE: W-TRANS, 2016.

ROADWAY SYSTEM

This section describes the physical characteristics of the Specific Plan Area roadway network.

Routes of Regional Significance

The CCTA has designated a regional system of streets that it has determined are critical to regional transportation in Contra Costa County and connectivity to neighboring Counties. In the vicinity of the Specific Plan Area, designated Routes of Regional Significance include the SR 4 freeway that is operated and maintained by Caltrans, as well as Lone Tree Way and Sand Creek Road.

State Route 4 (SR 4) is a State-maintained freeway with two travel lanes in each direction that connects to Antioch to the north of the city planning area and terminates to the south at the City Limits and turns into Vasco Road. In general, SR 4 runs north-south through the center of the city planning area and east-west as it enters Antioch until it terminates at I-80.

Lone Tree Way is a regional route that connects to the city of Antioch to the west and terminates just east of Brentwood Boulevard. The street transitions from having a rural character on its eastern portion, with one lane in each direction, to an urban arterial with three lanes in each direction plus turn lanes on the segments to the west of Empire Avenue. In urbanized areas, bicycle lanes and sidewalks are provided along the route, but in rural areas, there are no such facilities. The speed limit on the western portion of the route is posted at 45 miles per hour (mph), but it decreases to 35 mph east of O’Hara Avenue.

Sand Creek Road is an east-west corridor in central Brentwood that currently terminates at SR 4 to the west and Garin Parkway to the east. In the future, Sand Creek Road will be extended westerly to Heidorn Ranch Road and easterly to Sellers Avenue. This route generally has two lanes in each direction and turn lanes at intersections plus sidewalks and bicycle lanes. The posted speed limit varies between 35 and 45 mph.

Other Specific Plan Area Roadways

Heidorn Ranch Road is a north-south street extending from Lone Tree Way to Old Sand Creek Road. The street is classified as a major arterial. From Lone Tree Way to Lone Tree Plaza Drive, Heidorn Ranch Road has two travel lanes in each direction with a landscaped median. Just south of Lone Tree Plaza

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Drive, Heidorn Ranch Road transitions into a rural two-lane street with 10-foot travel lanes. The corridor has a posted speed limit of 45 mph.

Jeffery Way is a minor arterial and runs north-south, with two travel lanes in the northbound direction and one in the southbound direction. Jeffery Way currently terminates at Amber Lane and has a posted speed limit of 35 mph, primarily serving as an access to the SR 4 northbound freeway ramps as well as some retail uses.

Shady Willow Lane is a minor north-south arterial extending from Lone Tree Way to Sand Creek Road with two travel lanes in each direction. Shady Willow Lane has a posted speed limit of 35 mph, except near Pioneer Elementary School, where the speed limit decreases to 25 mph. It serves a variety of retail and residential uses in addition to the school.

Amber Lane is an east-west street connecting Shady Willow Lane to Empire Avenue. It primarily serves residential uses and is also a secondary access to Pioneer Elementary School.

Empire Avenue is a minor arterial, generally running north-south with two travel lanes in each direction. The street has a posted speed limit of 35 mph and primarily serves residential land uses, plus some retail near Lone Tree Way.

Study Intersections

The following 30 study intersections, most of which are along designated routes of regional significance, were identified as those most likely to be affected by development within the Specific Plan Area. Four of the study intersections are planned future intersections and therefore were not included in the existing conditions analysis; however, they are listed here as they will be included in future conditions analyses.

1. Lone Tree Way/James Donlon Blvd (Antioch)
2. Lone Tree Way/Dallas Ranch Rd (Antioch)
3. Lone Tree Way/Deer Valley Rd (Antioch)
4. Lone Tree Way/Indian Hill Dr (Antioch)
5. Lone Tree Way/Hillcrest Ave (Antioch)
6. Lone Tree Way/Vista Grande Dr (Antioch)
7. Lone Tree Way/Heidorn Ranch Rd
8. Lone Tree Way/Canada Valley Rd
9. Lone Tree Way/SR 4 South Ramps
10. Lone Tree Way/SR 4 North Ramps
11. Lone Tree Way/Shady Willow Ln
12. Lone Tree Way/Empire Ave
13. Lone Tree Way/Fairview Ave
14. Lone Tree Way/O'Hara Blvd
15. Lone Tree Way/Adams Ln
16. Lone Tree Way/Brentwood Blvd
17. Heidorn Ranch Rd/Lone Tree Plaza
18. Canada Valley Rd/Lone Tree Plaza
19. Jeffery Way/SR 4 North Ramps
20. Jeffery Way/Amber Ln (future)
21. Shady Willow Ln/Amber Ln
22. Shady Willow Ln/Grant St
23. Jeffery Way/Empire Ave (future)
24. Shady Willow Ln/Empire Ave
25. Sand Creek Rd/Hillcrest Ave (future)
26. Sand Creek Rd/Heidorn Ranch Rd (future)
27. Sand Creek Rd/SR 4 South Ramps
28. Sand Creek Rd/SR 4 North Ramps
29. Sand Creek Rd/Shady Willow Ln
30. Sand Creek Rd/Fairview Ave

Traffic volumes were obtained in October 2016, while all area schools were in session. Operating conditions during the AM and PM peak periods were evaluated to capture the highest volumes on the local transportation network. The locations of the study intersections and the existing lane configurations are shown in Figures 2.0-1A and Figure 2.0-1B. Existing peak hour traffic volumes are shown in Figure 2.0-2A and Figure 2.0-2B.

PUBLIC TRANSPORTATION SYSTEM

Transit service in Brentwood is primarily provided in the form of buses operated by the Eastern Contra Costa Transit Authority's (ECCTA) Tri Delta Transit. Additionally, regional commuter service is provided by the Bay Area Rapid Transit District (BART), which currently terminates in the nearby community of Pittsburg. An exhibit showing bus routes in and surrounding the Specific Plan Area is provided in Figure 2.0-3.

Tri Delta Transit

Tri Delta Transit is the primary transit provider in Brentwood. Tri Delta Transit provides regularly-scheduled fixed-route service to major activity centers and transit hubs within Eastern Contra Costa County. Tri Delta Transit operates four routes that serve the Specific Plan Area:

Route 380 provides connectivity between Antioch and the Pittsburg-Bay Point BART station, passing through Brentwood on the north side of the Specific Plan Area with a stop near Lone Tree Way/Canada Valley Road. It runs on weekdays and operates from 3:00 AM to 11:00 PM with approximately 30-minute headways.

Route 383 is a loop route connecting Brentwood with Oakley and Antioch. It generally operates on approximately one-hour headways between 8:30 AM and 5:00 PM in the counter-clockwise direction. Additional early morning service is provided once daily in the clockwise direction.

Route 385 provides connectivity between the downtown Brentwood Park & Ride lot and the Antioch Park & Ride lot at Hillcrest, running by several schools, major shopping areas, and employment centers. The route generally runs at hourly headways, but at peak periods the frequency is increased to 30 to 40 minutes. The route is operated on weekdays only.

Route 395 is a loop route providing weekend and holiday service between the Antioch Park & Ride at Hillcrest and commercial areas along Lone Tree Way and Sand Creek Road in Brentwood. The route operates on one-hour headways between 9:40 AM and 8:00 PM.

Front loading bicycle racks which can accommodate two bicycles are provided on all fixed-route transit buses in the Tri Delta Transit system. Bicycle rack spaces are available on a first-come, first-served basis. When the front-loading racks are full, drivers can accommodate bicycles inside the bus at their discretion. Additionally, Tri Delta offers bicycle lockers at the Brentwood Park & Ride facility, which are available on a first-come, first-served basis.

Bay Area Rapid Transit (BART)

BART provides regional heavy-rail transit services within Contra Costa, Alameda, San Francisco and San Mateo Counties, with construction underway to extend service to Santa Clara County. Currently, the nearest BART station is located in Pittsburg/Bay Point; however, a supplementary service, eBART, is under construction to connect communities east of Pittsburg with BART. eBART will not be an extension of the BART trains, but would be a supplementary rail service to coordinate with the arrival/departure of BART trains at the Pittsburg/Bay Point Station. Currently, the extension to Antioch is under construction and is expected to begin service in winter 2017/2018.

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There are long-term plans to extend the eBART service beyond Antioch. In 2014, a report was published titled *eBART Next Segment Study* which explored the options for an extension of the eBART project beyond the Antioch Station at Hillcrest Avenue. The study suggested multiple potential station locations in Brentwood, one of which is within the center of the Specific Plan Area. There are two conceptual designs of the Mokelumne Station. The first conceptual design includes eBART in the SR 4 median.

The median station concept is an at-grade configuration with the station located at ground level. The design also includes a pedestrian bridge connecting to the Mokelumne Trail which would provide pedestrian and bicycle access to the station as well as a bicycle and pedestrian crossing over SR 4.

The second concept would leave the median of SR 4 and swing to the west on an elevated structure to an above-ground station located west of SR 4. A disadvantage of this option is that once the guideway leaves the median of SR 4, development is expensive and challenging to return to the median if an extension southward is considered in the future.



eBART Mokelumne Station Concept – SR 4 Median



eBART Mokelumne Station Concept – Elevated Platform west of SR 4

Paratransit

Paratransit, also known as dial-a-ride or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. Individuals must be registered and certified as ADA eligible before using the service. Paratransit operators are required by the ADA to service areas within three-quarters of a mile of their respective, public fixed-route service. ECCTA serves as the ADA paratransit operator for the City of Brentwood.

Taxi and Ridesharing Service

Taxi service in Brentwood is provided by private operators that serve the greater Eastern Contra Costa County area and beyond. Additional ridesharing services, such as Uber and Lyft, are also available in Brentwood.

BICYCLE AND PEDESTRIAN SYSTEM

The following section describes the bicycle and pedestrian network in Brentwood. Peak hour bicycle and pedestrian volumes were collected at five of the study intersections near the Specific Plan Area. These bicycle and pedestrian volumes are shown in Figure 2.0-4 both for the peak hour and the calculated daily annual average. Daily averages were derived using count adjustment factors obtained from the National Bicycle & Pedestrian Documentation Project (NBPD) published in 2009.¹

Primary pedestrian and bicycle activity centers within the Specific Plan Area currently include the retail shopping centers along Lone Tree Way, Heidorn Ranch Road, and Shady Willow Lane, as well as Pioneer Elementary School on Shady Willow Lane. Bicyclists and pedestrians also frequently use existing segments of the Mokelumne Coast Trail to the east and west of the plan area for recreation.

BICYCLE FACILITIES

Bicycle circulation in Brentwood is supported by an existing network of off-street multi-use paths, on-street bike lanes, and bicycle routes. Notable facilities near the Specific Plan Area include a segment of the Mokelumne Coast to Coast Trail, Marsh Creek Trail, and Sand Creek Trail. Additionally, bicycle lanes are provided on most arterial and collector streets; however, there are some gaps in lanes near intersections and where adjacent parcels have not been developed. The *Countywide Bicycle and Pedestrian Master Plan*, shown in Figure 2.0-5, includes facilities that will expand upon the existing network to create a robust walking and biking circulation system in Brentwood.

The Mokelumne Coast Trail is a Class I multi-use trail and is identified as a regional trail in the *Countywide Bicycle and Pedestrian Master Plan*. The Mokelumne Coast Trail is planned to run through and connect the communities of Martinez, Concord, Pittsburg, Antioch, and Brentwood. Segments of the trail currently exist east and west of the Specific Plan Area boundaries, and future plans for the trail include a connection through the Specific Plan Area with a bicycle-pedestrian overcrossing at SR 4.

PEDESTRIAN FACILITIES

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal infrastructure, curb ramps, and streetscape amenities. Nearly complete sidewalk coverage, accessible curb ramps, and marked crosswalks are provided along the arterial streets in the Specific Plan Area; however, there are some gaps in coverage where adjacent parcels have not been developed. All signalized intersections with connecting sidewalk facilities have marked crosswalks and pedestrian signal crossing equipment and phases. Additionally, sidewalks are provided along the majority of residential streets within the Specific Plan Area. Figure 2.0-6 shows the existing pedestrian facilities within the Specific Plan Area.

LEVEL OF SERVICE STANDARDS AND METHODOLOGIES

Level of Service Standards

The *Brentwood General Plan* Circulation Element includes policies that establish the minimum Level of Service as follows:

- Policy CIR 1-5: Maintain LOS D or better operation at intersections within Brentwood that are not on designated Routes of Regional Significance, and LOS E or better operation at intersections in the Downtown Specific Plan Area. At unsignalized intersections, levels of

¹ See: <http://bikepeddocumentation.org>.

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service shall be determined for both controlled movements and for the overall intersection. Controlled movements operating at LOS E or LOS F are allowable if the intersection is projected to operate at LOS C or better overall, and/or if the “Peak Hour” signal warrant outlined in the California Manual on Uniform Traffic Control Devices remains unmet.

- Policy CIR 1-6: Intersections may be exempted from the LOS standards established in Policy CIR 1-5 in cases where the City Council finds that the infrastructure improvements needed to maintain vehicle LOS (such as roadway or intersection widening) would be in conflict with goals of improving multimodal circulation, or would lead to other potentially adverse environmental impacts. For those locations where the City allows a reduced motor vehicle LOS or queuing standard, additional multimodal improvements may be required in order to reduce impacts to mobility.

The East County Action Plan establishes Multimodal Transportation Service Objectives (MTSOs) for key corridors in and surrounding Brentwood, including the following two MTSOs that are relevant to roadway facilities in the Specific Plan Area:

- Freeways – The Delay Index should not exceed 2.5 during the a.m. or p.m. peak period.
- Suburban Arterial Routes – Signalized intersection levels of service should be maintained at LOS D or better on routes of regional significance, which in the Specific Plan Area include Lone Tree Way, Fairview Avenue, Hillcrest Avenue, and Sand Creek Road.
- Rural Roads – Roadway levels of service shall not exceed LOS D. There are no identified rural roadway routes near the PA-1 Specific Plan Area.

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, LOS A represents free flow conditions and LOS F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

Freeways

The East County Action Plan establishes the delay index as an MTSO. The delay index is the ratio of actual travel times on a facility divided by the travel times that occur during non-congested free-flow periods. Near Brentwood, this standard currently applies to SR 4 freeway segments to the north of Sand Creek Road. The free-flow speed of the freeway is considered to be 65 mph. Actual travel times are determined using the Caltrans Performance Monitoring System (PeMS), which includes data collected by sensors on and along the freeway.

Intersections

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The LOS for intersections controlled by a traffic signal were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology.

The LOS for the side-street stop controlled intersection at Lone Tree Plaza/Canada Valley Road were analyzed using the “Two-Way Stop-Controlled” intersection capacity method from the HCM. This methodology determines a LOS for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for the controlled approach with the highest delay.

The “All-Way Stop-Controlled” Intersection methodology from the HCM was used to determine the Level of Service at Shady Willow Lane/Amber Lane. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole, and is then related to a Level of Service.

The ranges of delay associated with the various levels of service are indicated in Table 2.0-3.

TABLE 2.0-3: INTERSECTION LEVEL OF SERVICE CRITERIA

LOS	SIGNALIZED	TWO-WAY STOP-CONTROLLED	ALL-WAY STOP-CONTROLLED
A	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Upon stopping, drivers are immediately able to proceed.
B	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 15 seconds. Drivers may wait for one or two vehicles to clear the intersection before proceeding from a stop.
C	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting at the side street.	Delay of 15 to 25 seconds. Drivers will enter a queue of one or two vehicles on the same approach, and wait for vehicle to clear from one or more approaches prior to entering the intersection.
D	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 25 to 35 seconds. Queues of more than two vehicles are encountered on one or more approaches.
E	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 35 to 50 seconds. Longer queues are encountered on more than one approach to the intersection.
F	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting side streets.	Delay of more than 50 seconds. Drivers enter long queues on all approaches.

SOURCE: HIGHWAY CAPACITY MANUAL, TRANSPORTATION RESEARCH BOARD, 2010.

LEVEL OF SERVICE ANALYSIS

SR 4 Freeway

Average vehicle speeds on the segment of SR 4 between Lone Tree Way and SR 160 in Antioch were obtained from the online Caltrans Performance Measurement System (PeMS) for a typical week in October 2016. The freeway is currently operating at or above free-flow speeds in both directions. Within the segment, speeds during the AM and PM peak periods tend to be slightly lower near the Lone Tree Way interchange (approximately 60 mph) compared to those at SR 160 (approximately 67 mph). The delay index calculation is summarized in Table 2.0-4.

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TABLE 2.0-4: PEAK HOUR DELAY INDEX ON SR 4 – SR 160 TO LONE TREE WAY

	AM PEAK HOUR		PM PEAK HOUR	
	EASTBOUND	WESTBOUND	EASTBOUND	WESTBOUND
Average Speed	64.4 mph	65.7 mph	64.7 mph	65.9 mph
Free Flow Speed	65 mph	65 mph	65 mph	65 mph
Delay Index	1.0	≤ 1.0	1.0	≤ 1.0

Intersections

The PA-1 Specific Plan circulation analysis will include evaluation of 30 intersections, 26 of which currently exist. The additional four intersections will be created in the future upon the completion of roadway extensions identified in the Brentwood and Antioch General Plans, including extensions of Sand Creek Road, Hillcrest Avenue, Heidorn Ranch Road, and Jeffery Way. Currently, all 24 existing study intersections are operating acceptably at LOS D or better during both the AM and PM peak hours. A summary of the intersection LOS calculations is contained in Table 2.0-5, and the LOS calculation sheets are included in Appendix B.

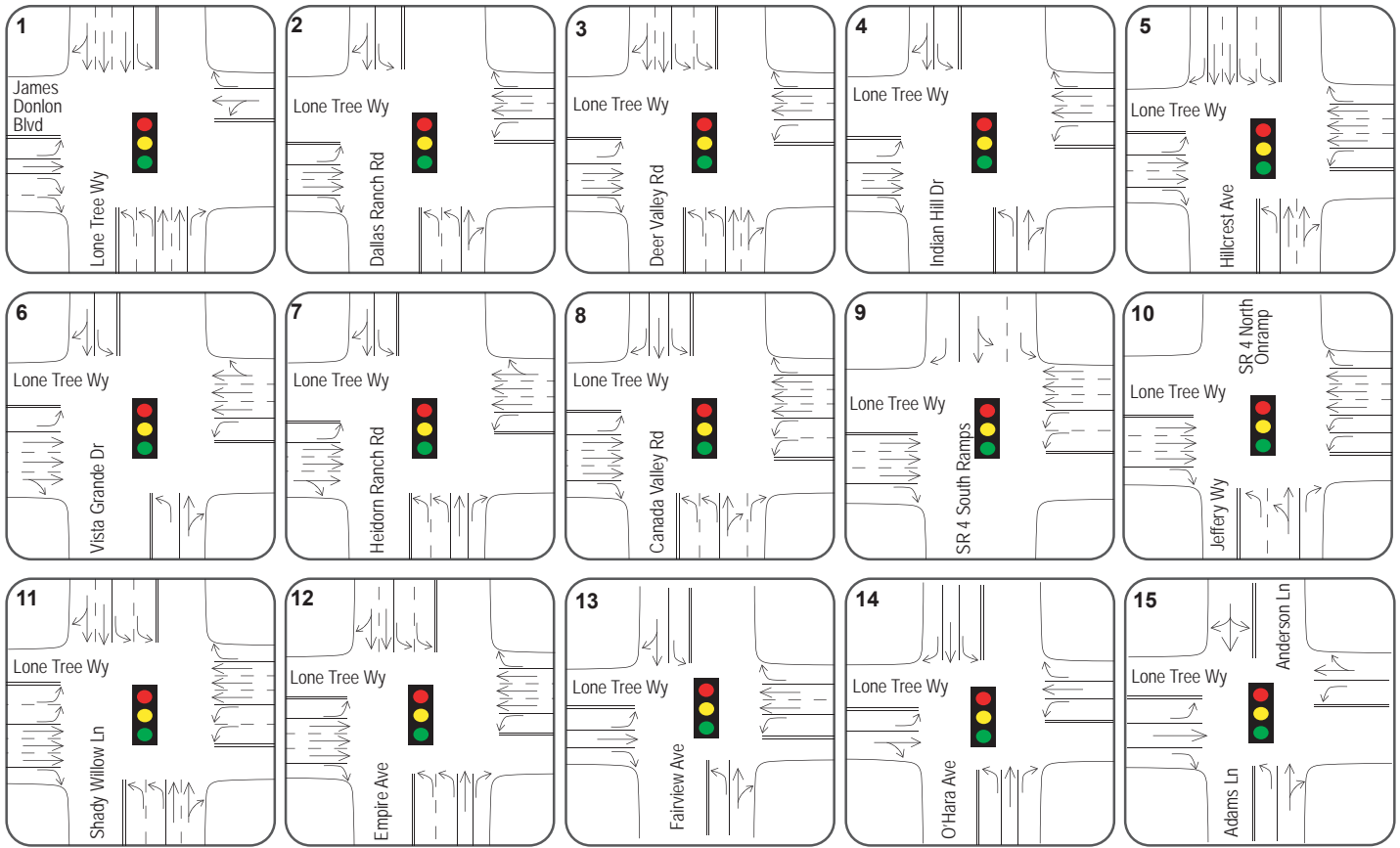
TABLE 2.0-5: SUMMARY OF EXISTING PEAK HOUR INTERSECTION LEVELS OF SERVICE

INTERSECTION		AM PEAK HOUR		PM PEAK HOUR	
		DELAY	LOS	DELAY	LOS
1.	Lone Tree Way/James Donlon Blvd	20.8	C	21.5	C
2.	Lone Tree Way/Dallas Ranch Rd	28.6	C	15.8	B
3.	Lone Tree Way/Deer Valley Rd	29.1	C	22.7	C
4.	Lone Tree Way/Indian Hill Dr	25.7	C	30.4	C
5.	Lone Tree Way/Hillcrest Ave	22.7	C	26.3	C
6.	Lone Tree Way/Vista Grande Dr	7.0	A	9.1	A
7.	Lone Tree Way/Heidorn Ranch Rd	8.9	A	10.2	B
8.	Lone Tree Way/Canada Valley Rd	19.9	B	40.8	D
9.	Lone Tree Way/SR 4 South Ramps	10.1	B	15.9	B
10.	Lone Tree Way/SR 4 North Ramps	8.2	A	12.8	B
11.	Lone Tree Way/Shady Willow Lane	17.1	B	20.5	C
12.	Lone Tree Way/Empire Avenue	16.1	B	38.6	D
13.	Lone Tree Way/Fairview Avenue	27.0	C	22.9	C
14.	Lone Tree Way/O'Hara Boulevard	39.0	D	34.2	C
15.	Lone Tree Way/Adams Lane	10.6	B	8.9	A
16.	Lone Tree Way/Brentwood Boulevard	17.0	B	15.5	B
17.	Heidorn Ranch Rd/Lone Tree Plaza	7.1	A	11.6	B
18.	Canada Valley Rd/Lone Tree Plaza	6.8	A	4.3	A
	Southbound Approach ¹	8.4	A	8.5	A
19.	Jeffery Way/SR 4 North Ramps	5.6	A	6.0	A
21.	Shady Willow Ln/Amber Ln	21.2	C	13.3	B
22.	Shady Willow Ln/Grant St	20.2	C	11.3	B
24.	Shady Willow Ln/Empire Ave	12.0	B	11.8	B
27.	Sand Creek Rd/SR 4 South Ramps	0.1	A	0.1	A
28.	Sand Creek Rd/SR 4 North Ramps	17.0	B	6.5	A
29.	Sand Creek Rd/Shady Willow Ln	22.3	C	20.4	C
30.	Sand Creek Rd/Fairview Ave	51.7	D	30.1	C

NOTES: INTERSECTIONS 20, 23, 25, AND 26 ARE FUTURE INTERSECTIONS THAT DO NOT CURRENTLY EXIST; DELAY IS MEASURED IN AVERAGE SECONDS PER VEHICLE; LOS = LEVEL OF SERVICE; BOLD = DEFICIENT OPERATION.

¹ DELAY ON STOP-CONTROLLED APPROACH

SOURCE: W-TRANS, 2016.



PRIORITY AREA 1 SPECIFIC PLAN

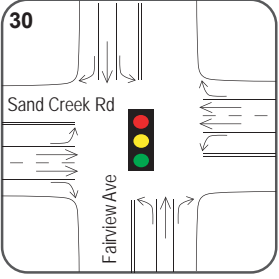
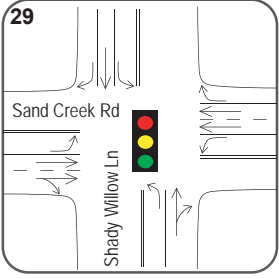
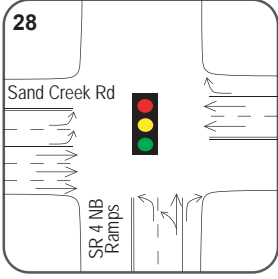
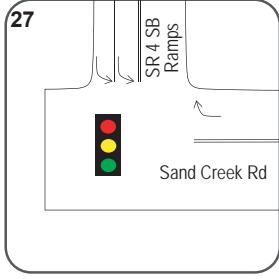
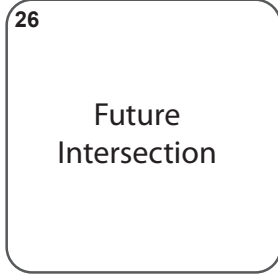
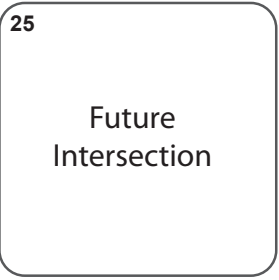
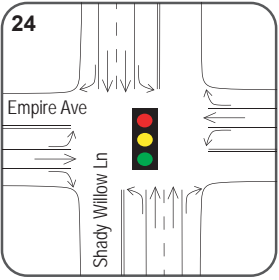
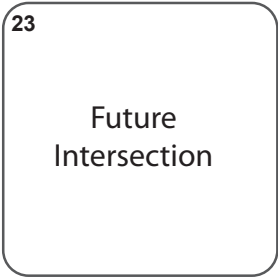
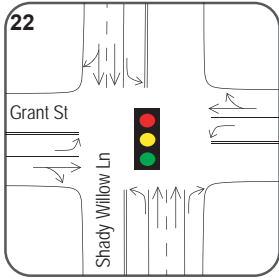
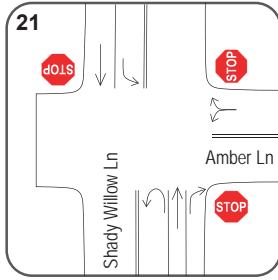
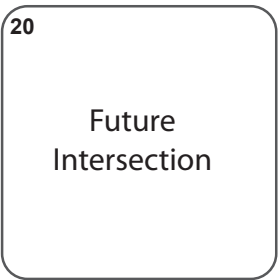
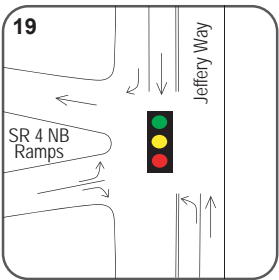
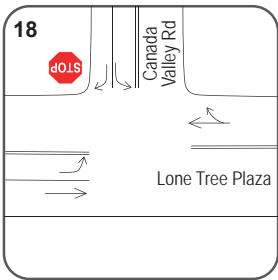
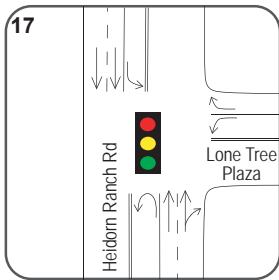
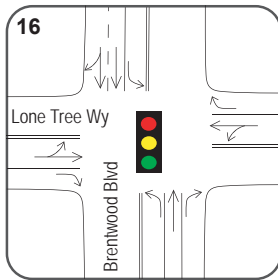
Figure 2.0-1A.Existing Circulation Network and Lane Configurations

LEGEND

- Study Intersection
- Specific Plan Area
- Future Streets



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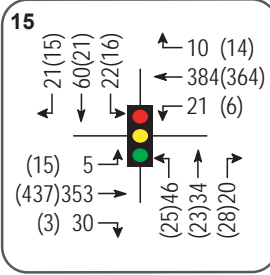
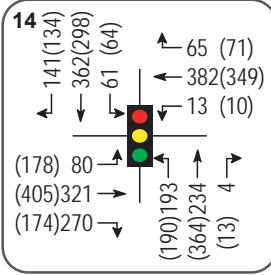
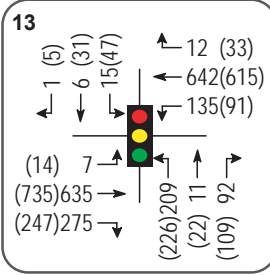
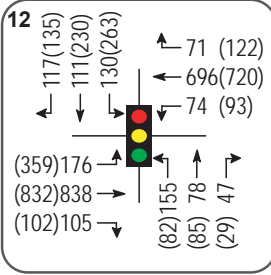
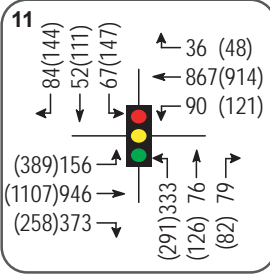
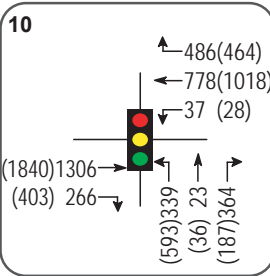
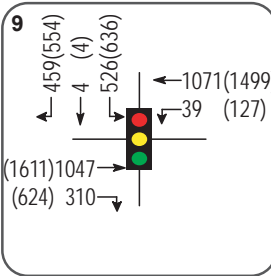
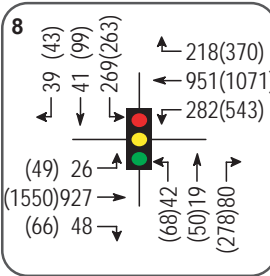
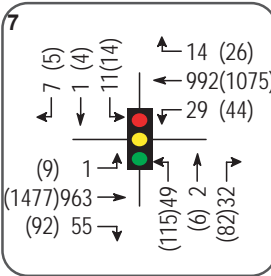
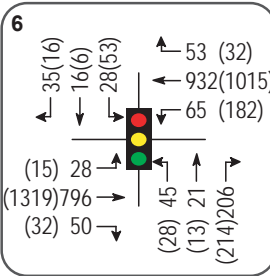
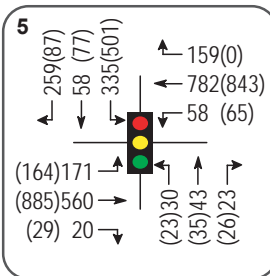
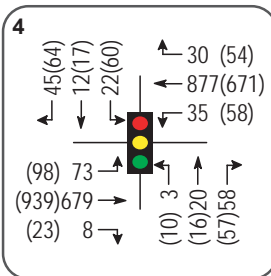
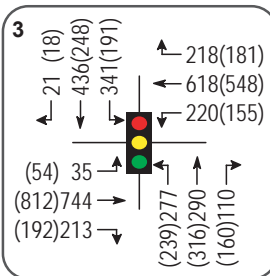
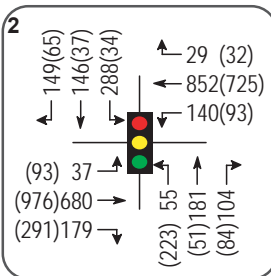
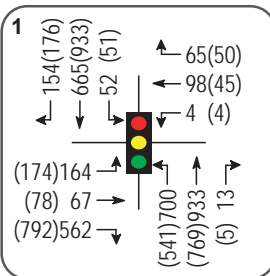
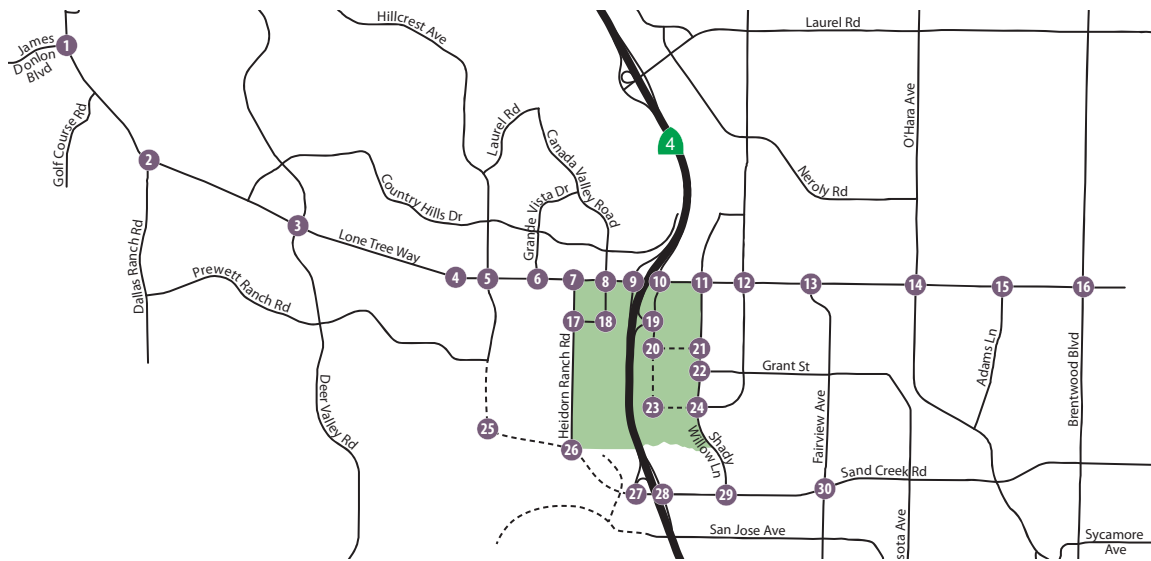
PRIORITY AREA 1 SPECIFIC PLAN

Figure 2.0-1B.Existing Circulation Network and Lane Configurations

- LEGEND**
- # Study Intersection
 - Specific Plan Area
 - Future Streets



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PRIORITY AREA 1 SPECIFIC PLAN

Figure 2.0-2A. Existing Traffic Volumes

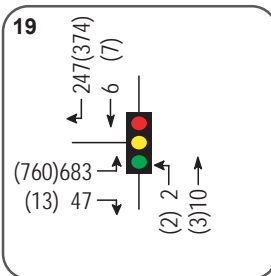
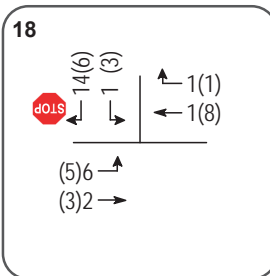
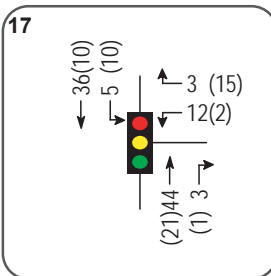
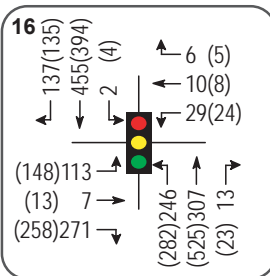
LEGEND

- # Study Intersection
- Specific Plan Area
- Future Streets
- xx AM Peak Hour Volume
- (xx) PM Peak Hour Volume



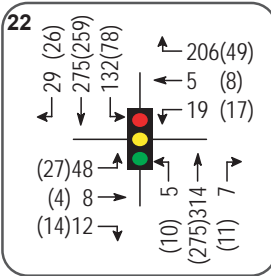
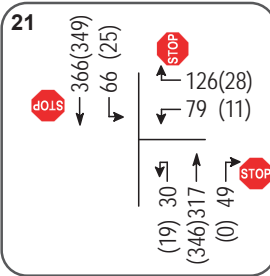

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

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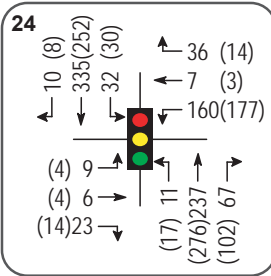
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Future Intersection



23

Future Intersection

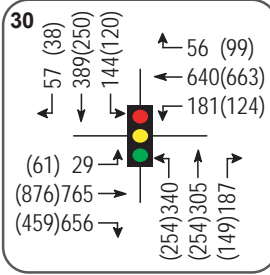
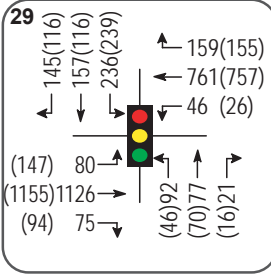
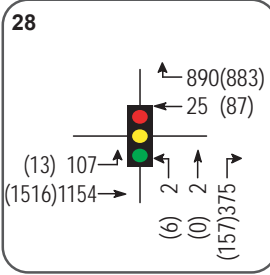
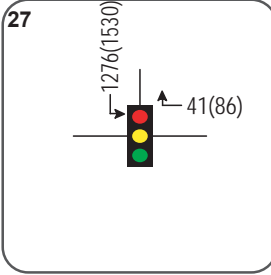


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Future Intersection

26

Future Intersection

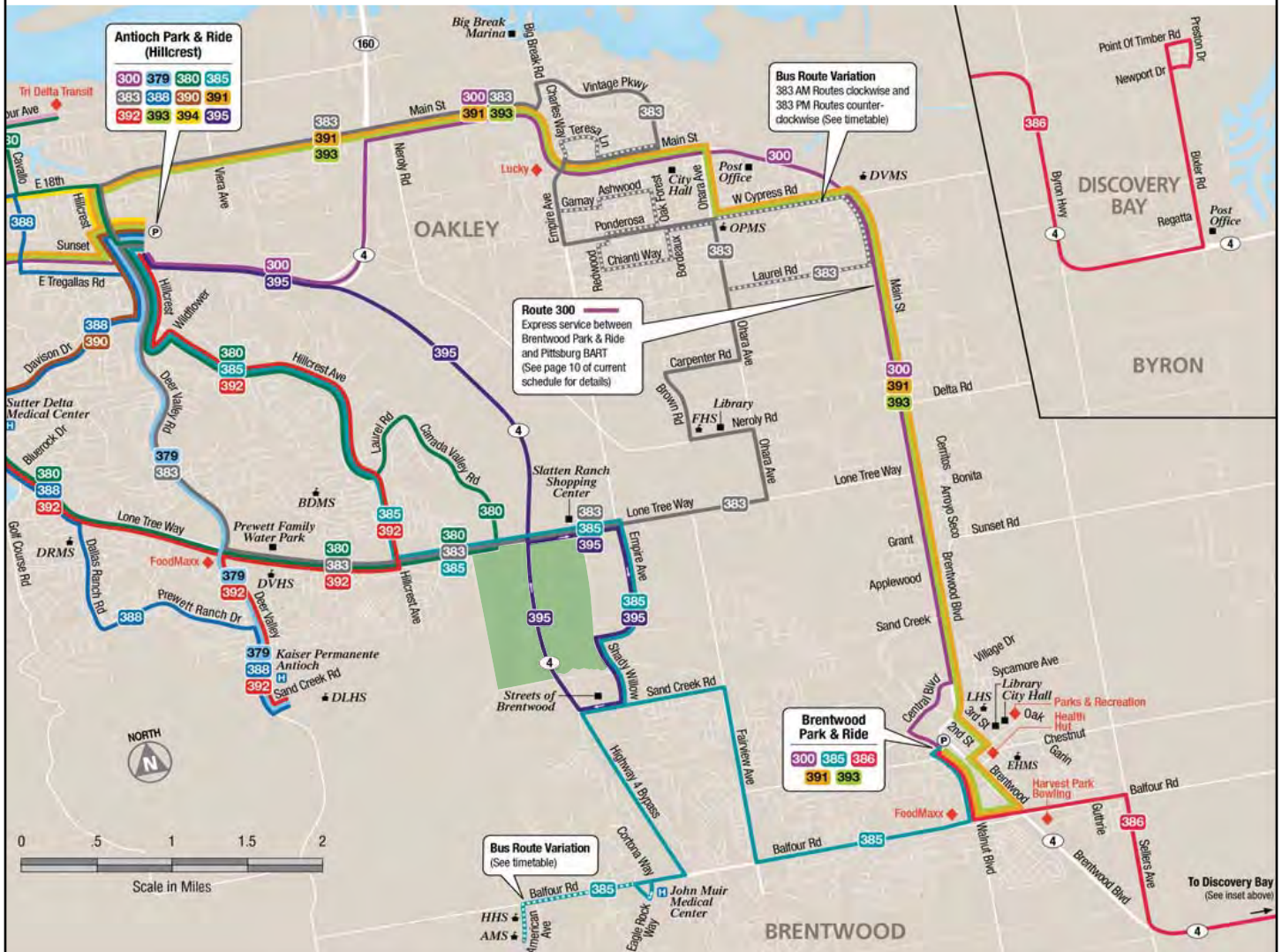


- LEGEND**
- # Study Intersection
 - Specific Plan Area
 - Future Streets
 - xx AM Peak Hour Volume
 - (xx) PM Peak Hour Volume

PRIORITY AREA 1 SPECIFIC PLAN
 Figure 2.0-2B. Existing Traffic Volumes



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Source: Tri Delta Transit System Map, effective March 8, 2015

PRIORITY AREA 1 SPECIFIC PLAN
 Figure 2.0-3.Existing Transit Routes

LEGEND

Specific Plan Area



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8	Peak Hour October 2016	Daily Estimate Annual Average
	15	390
	5	130
Lone Tree Way/Canada Valley Road		

11	Peak Hour October 2016	Daily Estimate Annual Average
	14	370
	9	240
Shady Willow Lane/Lone Tree Way		

22	Peak Hour October 2016	Daily Estimate Annual Average
	73	690
	8	70
Shady Willow Lane/Grant Street		

24	Peak Hour October 2016	Daily Estimate Annual Average
	6	170
	1	20
Shady Willow Lane/Empire Avenue		

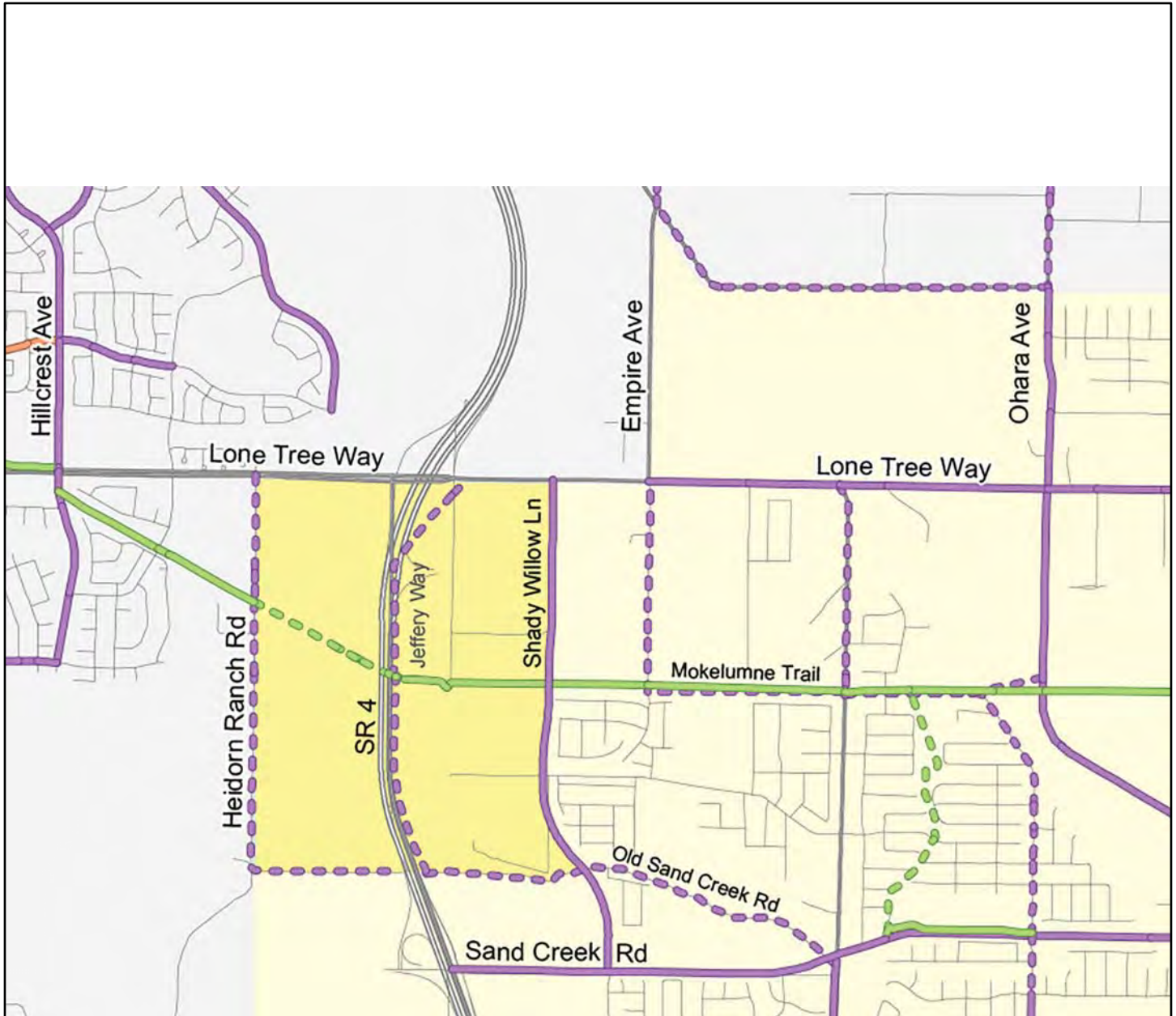
29	Peak Hour October 2016	Daily Estimate Annual Average
	18	490
	6	170
Shady Willow Lane/Sand Creek Road		

- LEGEND**
- Study Intersection
 - Specific Plan Area
 - Future Streets
 - Pedestrian Volume
 - Bicycle Volume

PRIORITY AREA 1 SPECIFIC PLAN
Figure 2.0-4. Pedestrian and Bicycle Volumes



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Source: Contra Costa Transportation Authority, 2013

PRIORITY AREA 1 SPECIFIC PLAN

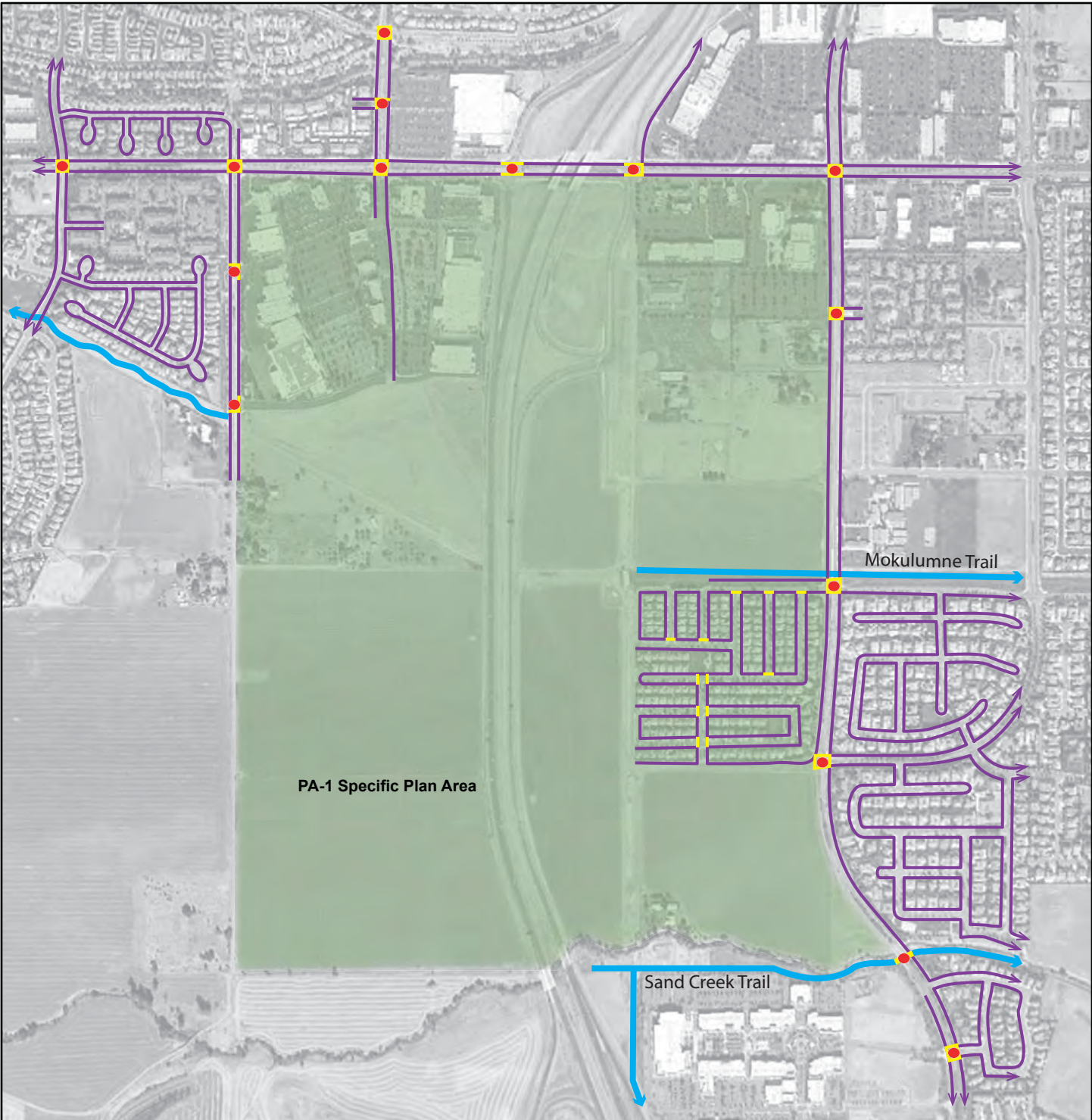
Figure 2.0-5. Existing and Planned Bicycle Facilities

LEGEND

- Brentwood City Limit
- Specific Plan Area
- Existing Class I Bicycle Facilities
- Proposed Class I Bicycle Facilities
- Existing Class II Bicycle Facilities
- Proposed Class II Bicycle Facilities
- Existing Class III Bicycle Facilities



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PA-1 Specific Plan Area

Mokulumne Trail

Sand Creek Trail

PRIORITY AREA 1 SPECIFIC PLAN

Figure 2.0-6. Existing Pedestrian Facilities

LEGEND

- Specific Plan Area
- Sidewalk
- Path/Trail
- Crosswalk
- Traffic Signal



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3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

This chapter addresses community services and facilities, and utilities within the city of Brentwood and the Plan Area. Utility services include the provision of water services, wastewater (sewer) services, solid waste disposal, electricity, and natural gas. Community services include fire protection, law enforcement, parks and recreation, schools, libraries, and other public facilities.

This chapter is divided into the following sections:

- 3.1 Utilities
 - 3.1.1 Water Supply
 - 3.1.2 Wastewater
 - 3.1.3 Solid Waste
 - 3.1.4 Electricity, Natural Gas, and Cable Service
- 3.2 Public Safety Services
 - 3.2.1 Fire Protection
 - 3.2.2 Law Enforcement
 - 3.2.3 Miscellaneous Public Safety
- 3.3 Parks and Recreation
- 3.4 Schools, Libraries, and Other Public Facilities

3.1 UTILITIES

This section address the provision of utilities in the city of Brentwood, including water, wastewater (sewer), solid waste, electricity, and natural gas and cable service.

3.1.1 WATER SUPPLY

This section describes the City of Brentwood’s water demands, water supplies, water distribution system, and master plans.

KEY TERMS

Acre feet: The volume of one acre of water to a depth of one foot. Each acre-foot of water is equal to 325,851.4 gallons.

BGS: Below ground surface.

GPD: Gallons per day.

GPM: Gallons per minute.

Groundwater: Water that is underground and below the water table, as opposed to surface water, which flows across the ground surface. Water beneath the earth’s surface fills the spaces in soil, gravel, or rock formations. Pockets of groundwater are often called “aquifers” and are the source of drinking water for a large percentage of the population in the United States. Groundwater is often extracted using wells which pump the water out of the ground and up to the surface. Groundwater is naturally

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

replenished by surface water from precipitation, streams, and rivers when this recharge reaches the water table.

MG: Million gallons.

MGD: Million gallons per day.

Surface water: Water collected on the ground or from a stream, river, lake, wetland, or ocean. Surface water is replenished naturally through precipitation, but is lost naturally through evaporation and seepage into soil.

REGULATORY FRAMEWORK

STATE

California Department of Health Services

The Department of Health Services, Division of Drinking Water and Environmental Management, oversees the Drinking Water Program. The Drinking Water Program regulates public water systems and certifies drinking water treatment and distribution operators. It provides support for small water systems and for improving their technical, managerial, and financial capacity. It provides subsidized funding for water system improvements under the State Revolving Fund (“SRF”) and Proposition 50 programs. The Drinking Water Program also oversees water recycling projects, permits water treatment devices, supports and promotes water system security, and oversees the Drinking Water Treatment and Research Fund for MTBE and other oxygenates.

Consumer Confidence Report Requirements

California Code of Regulations (CCR) Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the Department of Health Services. The Consumer Confidence Report provides information regarding the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminant levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

Urban Water Management Planning Act

The Urban Water Management Planning Act has as its objectives the management of urban water demands and the efficient use of urban water. Under its provisions, every urban water supplier is required to prepare and adopt an urban water management plan. An “urban water supplier” is a public or private water supplier that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. The plan must identify and quantify the existing and planned sources of water available to the supplier, quantify the projected water use for a period of 20 years, and describe the supplier’s water demand management measures. The urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Department of Water Resources must receive a copy of an adopted urban water management plan.

Senate Bill (SB) 610 and Assembly Bill (AB) 901

The State Legislature passed SB 610 and AB 901 in 2001. Both measures modified the Urban Water Management Planning Act.

SB 610 requires additional information in an urban water management plan if groundwater is identified as a source of water available to an urban water supplier. It also requires that the plan include a description of all water supply projects and programs that may be undertaken to meet total projected water use. SB 610 requires a city or county that determines a project is subject to CEQA to identify any public water system that may supply water to the project and to request identified public water systems to prepare a specified water supply assessment. The assessment must include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and water received in prior years pursuant to these entitlements, rights, and contracts.

AB 901 requires an urban water management plan to include information, to the extent practicable, relating to the quality of existing sources of water available to an urban water supplier over given time periods. AB 901 also requires information on the manner in which water quality affects water management strategies and supply reliability. The bill requires a plan to describe plans to supplement a water source that may not be available at a consistent level of use, to the extent practicable. Additional findings and declarations relating to water quality are required.

Senate Bill (SB) 221

SB 221 adds Government Code Section 66455.3, requiring that the local water agency be sent a copy of any proposed residential subdivision of more than 500 dwelling units within five days of the subdivision application being accepted as complete for processing by the city or county. It also adds Government Code Section 66473.7, establishing detailed requirements for establishing whether a “sufficient water supply” exists to support any proposed residential subdivisions of more than 500 dwellings, including any such subdivision involving a development agreement. When approving a qualifying subdivision tentative map, the city or county must include a condition requiring availability of a sufficient water supply. The applicable public water system must provide proof of availability. If there is no public water system, the city or county must undertake the analysis described in Government Code Section 66473.7. The analysis must include consideration of effects on other users of water and groundwater.

LOCAL

City of Brentwood Urban Water Management Plan 2015

The purpose of the 2015 Urban Water Management Plan is to ensure efficient use of urban water supplies in the City of Brentwood and promote conservation. The UWMP discusses not only the availability of water but also water use, reclamation, and water conservation activities. The UWMP complies with the Urban Water Management Planning Act (UWMP Act) (California Water Code [CWC] Section 10610 et seq.), the Water Conservation Act of 2009 (CWC Section 10608), and the 20x2020 Water Conservation Plan, which are being implemented by the California Department of Water Resources (DWR).

City of Brentwood Water Master Plan (2006)

The City’s 2006 Water Master Plan includes a summary of the City’s system-wide water demands, the planning criteria used to determine water system demands, the City’s water distribution system model, an analysis of the City’s water system, and a summary of existing and future water system facilities.

City of Brentwood General Plan

The City of Brentwood General Plan, adopted in 2014, identifies the following goals and policies related to water supplies:

Infrastructure Element

Goal IF 2: Provide an adequate, reliable, and safe water supply, storage, and distribution system

Policy IF 2-1: Ensure the water system and supply is adequate to meet the needs of existing and future development.

Policy IF 2-2: Ensure safe drinking water standards are met throughout the community.

Policy IF 2-3: Continue to implement a comprehensive water strategy that balances the need to supply water to all users served by the City with potable water use reduction measures.

Policy IF 2-4: Pursue additional water supply agreements to supplement the City's existing system.

Policy IF 2-5: Continue efforts to reduce potable water use and increase water conservation.

Policy IF 2-6: Use recycled water for landscaping irrigation within City roadways, parks, and facilities to the greatest extent feasible.

Conservation Element

Policy COS 9-5: Promote water conservation among water users.

Policy COS 9-6: Continue to require new development to incorporate water efficient fixtures into design and construction.

Policy COS 9-7: Promote the use of reclaimed water and other non-potable water sources.

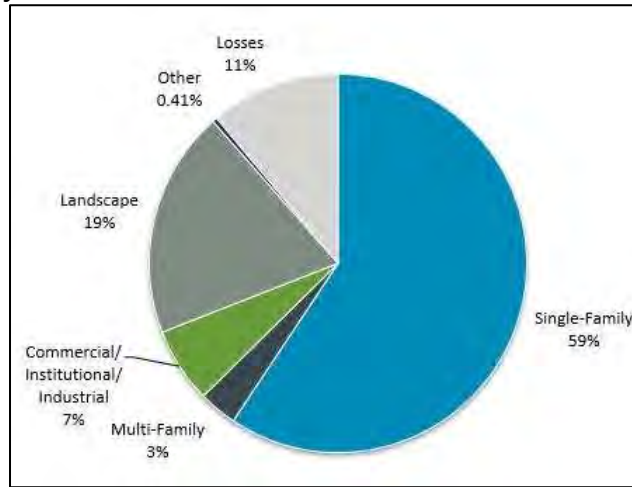
Policy COS 9-8: Encourage large-scale developments and golf course developments to incorporate dual water systems.

WATER DEMANDS

As of 2015, the City had 18,417 water service accounts. The total water volume supplied in Brentwood in 2015 was 3,036 million gallons per year (mgy).

The City's water use is predominantly by residential customers. Single-family residential use accounts for 59% of total water consumption. Landscape irrigation accounts for 19% of total water use, commercial/industrial/institutional for 7% of use, multi-family residential for 3% of total use, and other for 0.41% of total use, while water losses account for 11% of raw water demand as shown in Chart 3-1 below. (City of Brentwood UWMP, 2015).

Chart 3.1-1: 2015 City of Brentwood Potable and Raw Water Demand by Water Use Sector



The City’s projected annual use demands for potable and raw water through 2040 is shown in Table 3.1-1. As shown in Table 3.1-1, water demand increases are projected from 4,303 mgd in 2020, to a buildout demand (projected to occur by 2040) of 5,736 mgd.

TABLE 3.1-1: RETAIL: DEMANDS FOR POTABLE AND RAW WATER - PROJECTED

USE TYPE	PROJECTED WATER USE (MILLION GALLONS PER YEAR)				
	2020	2025	2030	2035	2040
Single Family	2,556	2,747	2,952	3,171	3,408
Multi-Family	140	151	162	174	187
Commercial	277	298	320	344	369
Landscape	835	897	964	1,035	1,112
Other	17	18	20	21	23
Losses	478	513	552	593	637
TOTAL	4,303	4,624	4,968	5,338	5,736

NOTES: UNITS: MGD; INSTITUTIONAL AND INDUSTRIAL DATA INCLUDED IN COMMERCIAL TOTALS.

SOURCE: CITY OF BRENTWOOD 2015 UWMP.

Water use varies seasonally, with maximum water use typically occurring during the months of June, July, August, and September, due to increased landscape irrigation. The City must be able to meet demand from all supply sources on the maximum demand day of the year, and also provide adequate water distribution system facilities to supply customers and maintain adequate pressure on the maximum demand day. The City projects a maximum demand of 41 million gallons per day (mgd) at buildout (City of Brentwood UWMP, 2015). Table 3.1-2 shows the Projected Maximum Daily Water Demands (2020-2040) for the City of Brentwood.

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

TABLE 3.1-2: PROJECTED MAXIMUM DAILY WATER DEMANDS (2020-2040) FOR THE CITY OF BRENTWOOD

YEAR	TOTAL MAXIMUM DAILY DEMAND – HIGH GROWTH RATE SCENARIO (MGD)	TOTAL MAXIMUM DAILY DEMAND – STRAIGHT-LINE GROWTH SCENARIO (MGD)	WELL SUPPLY (MGD)	RBWTP AND COBWTP (MGD)
2020	35	26	5	17-24
2025	36.5	30	5	21-24
2030	38	33.5	5	28.5-31.5
2035	39.5	37	5	32-34.5
2040	41	41	5	36

NOTES: RBWTP = RANDALL-BOLD WATER TREATMENT PLANT; COBWTP = CITY OF BRENTWOOD WATER TREATMENT PLANT.

ACTUAL WATER DEMANDS ARE EXPECTED TO FALL IN BETWEEN THESE TWO PROJECTIONS.

SOURCE: CITY OF BRENTWOOD 2015 UWMP.

WATER SUPPLIES

The City of Brentwood has the following existing water supplies:

- Treated surface water for potable water uses
- Untreated surface water for landscape irrigation and industrial uses
- Groundwater for potable water uses
- Recycled water for non-potable water uses

Each source of supply is described below, and shown on Table 3.1-3.

TABLE 3.1-3: CITY OF BRENTWOOD WATER SUPPLIES (2015)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2015		
		ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater	Tracy Subbasin (5-22.15)	828	Drinking Water	1,825
Surface water	COBWTP Supply (ECCID)	1,105	Drinking Water	2,370
Purchased or Imported Water	RBWTP Supply (ECCID)	705	Drinking Water	2,190
Surface Water	ECCID Non-Potable Supply	268	Raw Water	263
Recycled Water	City WWTP Supply	130	Recycled Water	1,697
Total		3,036	--	8,345

SOURCE: CITY OF BRENTWOOD 2015 UWMP.

Surface Water

In 1999, the City entered into an agreement with ECCID that provides the City with a permanent entitlement to purchase 14,800 AF/yr (4,823 MGY) of surplus irrigation water from the Delta. ECCID has pre-1914 water rights, which are not subject to delivery reductions during water shortages, including regulatory restricted and drought years. The water purchased by the City may only be used by the City and its retail customers within the city limits or within the ECCID service area (CCLAFCO, 2007). Surface

water supplies for the City originate from Rock Slough. The supply is transported through the Contra Costa Canal for treatment at the City of Brentwood Water Treatment Plant (COBWTP).

The COBWTP was built in 2008 to serve the City. The City and the Contra Costa Water District (CCWD) constructed the COBWTP as a joint venture. The completed first phase of the COBWTP, which has been constructed and is in operation, can treat up to 16.5 mgd (6,023 MGY) of surface water. However, the COBWTP is designed so that it can be expanded to an ultimate capacity of 33 mgd (12,045 MGY) to serve a portion of the City's projected water demands through 2040. COBWTP processes include flocculation, sedimentation, ozonation, filtration, and disinfection.

The City also obtains raw surface water for non-potable landscape irrigation from the ECCID Canal. Water is pumped to the non-potable irrigation system via the Roddy Ranch Pump Station, located on the canal. Current users include golf courses, parks, schools, and commercial landscape areas. The City purchased 268 million gallons (0.73 mgd average daily use) in 2015 (DWR, 2015). The City projects a purchase of about 500 million gallons per year by 2035.

Groundwater

The City pumps groundwater from an alluvial basin underlying the city. The City has nine permitted groundwater wells within its service area, seven of which are active wells. The total design capacity of the wells is 6.63 mgd. The firm design capacity of the wells, where firm capacity is the capacity of all the wells minus the capacity of the largest well, is 5.19 mgd.

The City treats groundwater with chloramines at the wellheads prior to delivery to the drinking water distribution system. The City has two main well fields. Wells 6, 7, 8, 14, and 15, are located in the northeast part of the city, and Wells 12 and 13 are in the south part of the city. Of the two wells that are not in use, Well 9 does not have a disinfection system, and Well 11 is not used because of high nitrate concentrations at this location.

Recycled Water Supplies

The City's WWTP receives, treats, and discharges municipal wastewater that is generated, collected, and treated within the City's service area. The WWTP produces tertiary filtered and disinfected water suitable for non-potable reuse.

The City's WWTP provides recycled water for a variety of landscape and industrial uses. The WWTP has an average dry weather flow capacity of 5 mgd and was designed to be expendable to an average dry weather flow capacity of 10 mgd. The treatment system consists of a headworks (screening and grit removal), oxidation ditches and denitrification basins providing biological treatment, secondary clarification, tertiary filtration, chlorine disinfection, dechlorination, and a cascade aeration system (RWQCB, 2013). Wastewater from the City that is not reused is treated and discharged to Marsh Creek, which drains to Big Break in the Delta. Periodically, on-site percolation ponds may be used for land disposal of a limited amount of secondary treated effluent.

Purchased Water

The City has purchased a permanent capacity share of 6 mgd at the Randall-Bold Water Treatment Plant (RBWTP) and may use additional capacity on an as-needed basis (CCLAFCO, 2007, p. 3-9). The City uses the entire 6 mgd (2,190 MGY), but does not project to use additional capacity in future years. CCWD has operated the RBWTP since 1992. The RBWTP has a design capacity to treat up to 40 mgd. The RBWTP is jointly owned by DWD and CCWD. The City receives water from the CCWD portion of the facility. Raw water is pumped to the RBWTP from the Rock Slough intake via the Contra Costa Canal, which is

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

operated by CCWD, for treatment prior to distribution as a public water supply. Water can also be stored in the off-stream Los Vaqueros Reservoir from the Old River and Middle River intakes. During periods of low salinity in the Delta, raw water is pumped into the Los Vaqueros Reservoir and stored for future use. This stored water is supplied to the Contra Costa Canal and blended with raw water from the Rock Slough intake as needed.

PROJECTED WATER DEMANDS AND SUPPLIES

Table 3.1-4 summarizes annual projections of demand and supplies to meet those demands through 2040, as documented in the City’s 2015 Urban Water Management Plan. As shown in Table 3.1-4, water demands are met with a water surplus for all future year estimates.

TABLE 3.1-4: PROJECTION OF WATER DEMANDS AND SUPPLIES (MGY)

	2020	2025	2030	2035	2040	
Demand	4,509	4,905	5,325	5,771	6,244	S O U R C E
Supplies	9,194	10,043	10,043	10,043	10,043	
Difference between Supply and Demand	4,685	5,137	4,717	4,272	3,798	

: BRENTWOOD URBAN WATER MANAGEMENT PLAN 2015

Citywide Water Distribution System

The City maintains a potable water distribution system, which is served by wells, the RBWTP, the COBWTP, a non-potable recycled water distribution system supplied from the City’s WWTP, and a non-potable irrigation water system supplied from ECCID’s canal. The two non-potable water systems are connected, and can be operated together or independently of each other by opening or closing system valves.

The potable water system has three pressure zones, seven booster pump stations, and six distribution system reservoirs. Figure 3.1-1 shows a plan view map of existing and planned potable water system facilities (as shown in the Brentwood UWMP 2015).

The City maintains approximately 172 miles of distribution system mains. The oldest water mains were constructed in 1940. Distribution system pipelines range in diameter. Larger diameter transmission mains have been constructed to integrate surface water into the distribution system.

Zone 1 is the largest zone, covering the east side of the city. The zone provides service to customers with elevations ranging from 0 to 110 feet. Zone 2 is located in the hills on the west and southwest side of the city and serves customers with elevations ranging from 110 feet to 220 feet. Zone 3 is the highest elevation zone and is split into three isolated islands that operate as independent subzones, serving customers with elevations ranging from 220 feet to 330 feet. Zone 1 is supplied directly by the wells, the RBWTP and the COBWTP. The zone has three distribution system storage reservoirs, with a total storage volume of 10.8 million gallons (MG) to provide for operational, fire, and emergency needs. Zone 2 is supplied via three booster pump stations. The zone has three distribution system reservoirs, with a total capacity of 8.0 MG. All Zone 3 subzones are currently hydropneumatic zones, with no reservoir storage located in the zones.

Future expansion of the system will be in new development areas planned for Zones 1, 2, and 3. Proposed pipelines for the future expansion areas are shown on Figure 3.1-1. Zone 1 will include new pipelines on the north side and east side of the zone, north of Sycamore Avenue and east of the Union

Pacific Railroad tracks. Zone 2 will be expanded on the northwest side of the system, to the east and west of State Route 4 to Heidorn Ranch Road on the west side of the system, and on the south side of the system along Vineyards Parkway, west of State Route 4. Future expansion in Zone 3 includes extension of Zone 3 Central, to the west, south of Balfour Road to Deer Valley Road, and completion of Zone 3 south, along Vineyard Parkway.

Water Distribution System SPA

The Specific Plan Area is located within Zone 2. Figure 3.1-1 shows the existing and proposed Potable Water System within the Specific Plan Area. As shown on Figure 3.1-1, potable water utilities are located throughout the developed portions of the Plan area, along the western portion of the site, and along Jeffery Way to Amber Lane in the north central portion of the site.

3.1.2 WASTEWATER

This section describes the City of Brentwood's wastewater infrastructure, wastewater flows, treatment plant permit requirements, and previous infrastructure planning. The City provides wastewater collection, treatment and disposal services for its residents and businesses, comprising approximately 17,204 residential connections and 476 commercial business connections. Facilities include a collection system with gravity sewers, lift stations, and a Wastewater Treatment Plant (WWTP). Information in the section is primarily derived from the City of Brentwood's 2015 Sewer System Management Plan, and Wastewater Collection System Master Plan 2010.

KEY TERMS

Effluent: In the context of wastewater treatment plants, effluent is wastewater that has been through a treatment process to remove pollution and undesirable constituents from the water.

NPDES: Water pollution degrades surface waters making them unsafe for drinking, fishing, swimming, and other activities. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

WWTP: Wastewater treatment plant. Treatment of wastewater may include the following processes: screening to remove large waste items; grit removal to allow sand, gravel, and sediment to settle out; primary sedimentation where sludge can settle out of the wastewater; secondary treatment to substantially degrade the biological content of the sewage; tertiary treatment to raise the quality of the effluent before it is discharged; and, discharge.

REGULATORY FRAMEWORK

STATE

State Water Resources Control Board/Regional Water Quality Control Board

In California, all wastewater treatment and disposal systems fall under the overall regulatory authority of the State Water Resources Control Board (SWRCB) and the nine California Regional Water Quality Control Boards (RWQCBs), who are charged with the responsibility of protecting beneficial uses of State

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waters (ground and surface) from a variety of waste discharges, including wastewater from individual and municipal systems. The City of Brentwood falls within the jurisdiction of the Central Valley RWQCB.

The RWQCB's regulatory role often involves the formation and implementation of basic water protection policies. These are reflected in the individual RWQCB's Basin Plan, generally in the form of guidelines, criteria and/or prohibitions related to the siting, design, construction, and maintenance of on-site sewage disposal systems. The SWRCB's role has historically been one of providing overall policy direction, organizational and technical assistance, and a communications link to the State legislature.

The RWQCBs may waive or delegate regulatory authority for on-site sewage disposal systems to counties, cities or special districts. Although not mandatory, it is commonly done and has proven to be administratively efficient. In some cases this is accomplished through a Memorandum of Understanding (MOU), whereby the local agency commits to enforcing the Basin Plan requirements or other specified standards that may be more restrictive. The RWQCBs generally elect to retain permitting authority over large and/or commercial or industrial on-site sewage disposal systems, depending on the volume and character of the wastewater.

LOCAL

City of Brentwood Wastewater Collection System Master Plan (2010)

The City's 2010 Wastewater Collection System Master Plan includes a description and maps of the City's wastewater collection system, system-wide flow projections, hydraulic models of system flows, an analysis of the system's capacity, a summary of system capacity improvements that are needed, and a summary of the current related CIP schedule and costs for wastewater system improvements.

City of Brentwood Sewer System Management Plan (2015 Revision)

In May 2006, the State Water Resources Control Board (SWRCB) implemented Order No. 2006-0003-DWQ. Any municipality that owns or operates a sanitary sewer system greater than 1.0 mile in length and that collects and/or conveys untreated or partially treated wastewater to publicly owned treatment plants in the State of California is required to comply with the terms of this order. This order requires the development and implementation of a system-specific Sanitary Sewer Management Plan (SSMP). The City's SSMP facilitates the overall management of the City of Brentwood's sewer system.

The SSMP is intended to meet the requirements of the Statewide General Waste Discharge Requirements (GWDR). The SSMP includes eleven elements, as listed below:

1. Goals
2. Organization
3. Legal Authority
4. Measures and Activities (Operation and Maintenance Program)
5. Design and Construction Standards (Design and Performance Provisions)
6. Overflow Emergency Response Plan
7. Fats, Oils and Grease Control Program
8. Capacity Management (System Evaluation and Capacity Assurance Plan)

9. Monitoring, Measurement, and Program Modification
10. SSMP Audits
11. Communication Plan

City of Brentwood General Plan

The City of Brentwood General Plan identifies the following goals and policies related to wastewater services:

Infrastructure Element

Goal IF 3: Provide adequate wastewater collection and treatment capacity

Policy IF 3-1: Ensure adequate sewage conveyance and treatment infrastructure to meet existing and future development.

Policy IF 3-2: Maintain the existing wastewater system on a regular basis to increase the lifespan of the system and ensure public safety.

WASTEWATER TREATMENT

The City Wastewater Division operates and maintains the City's wastewater treatment plant, a tertiary treatment plant that provides recycled water for a variety of landscape and industrial uses. The plant has an average dry weather flow capacity of 5 mgd and was designed to be expandable to an average dry weather flow capacity of 10 mgd. After wastewater is treated, it is normally discharged into Marsh Creek (a water of the United States and a tributary to the San Joaquin River/Delta) or recycled for irrigation. This effluent meets or exceeds CA Title 22 drinking water standards. Periodically, on-site percolation ponds may be used for land disposal of a limited amount of secondary treated effluent.

The wastewater treatment plant, shown in Figure 3.1-2, was commissioned in 2003 and incorporates the following processes:

- headworks (screening and grit removal),
- two oxidation ditch activated sludge basins,
- two denitrification basins,
- two secondary clarifiers,
- two banks of two single media filters (a total of four filters),
- a chlorine contact chamber,
- dechlorination, and
- a cascade aeration system.

Biosolids are mixed with a polymer and then dewatered using one of two belt filter presses. Dewatered biosolids are hauled off-site to a local landfill.

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Storm water runoff from the WWTP site is collected on-site and directed to a series of percolation ponds. At no point does storm water from the plant directly discharge into surface water.

WASTEWATER FLOWS

Wastewater flows are typically evaluated for several conditions, including:

- Average Dry Weather Flow (ADWF)– This is the flow rate that is considered to be the actual wastewater flow from homes and businesses in the community (although it may include some flow resulting from groundwater entering the sewer system). It is measured during the summer, when the weather is dry and there is minimal infiltration and no inflow. This flow is dependent on the number of residents and number and type of businesses within the community. It varies throughout the day, with the peak diurnal flow typically occurring in the morning as the community residents wake up and prepare for the day.
- Infiltration and Inflow (I&I) – This is flow that enters the sewer system from rainfall and from increased levels of groundwater caused by the rainfall or by seasonal variation of groundwater levels.
- Peak Hour Wet Weather Flow (PHWWF) – This is the sum of the peak WWF and the peak I&I. The PHWWF is the peak flow rate that is expected to occur during large storm events.

The average dry weather flow to the City’s WWTP in 2012 was 3.4 mgd. The discharge permit defines an average daily discharge flow effluent limitation of 5.0 mgd, which is determined annually.

Effluent Discharge Permit

On January 25, 2008, the Central Valley RWQCB adopted Waste Discharge Requirements Order R5-2008-0006 (NPDES Permit) and Cease and Desist Order R5-2008-0007 (CDO), prescribing waste discharge requirements and compliance time schedules for the City of Brentwood Wastewater Treatment Plant. The Cease and Desist Order addressed compliance with newly imposed copper and effluent temperature requirements. The CDO was rescinded on December 6, 2012. The NPDES Permit expired on December 31, 2012, and the City submitted a Report of Waste Discharge for permit renewal. The current NPDES Permit Waste Discharge Requirements Order R5-2010-0102, CAS612008 issued by the San Francisco Bay Regional Water Quality Control Board and CA0083313 issued by the Central Valley Regional Water Quality Control Board continue in effect.

WASTEWATER COLLECTION SYSTEM

The City’s wastewater collection system consists of approximately 188 miles of pipe, ranging from 4 inches to 42 inches in diameter, and two lift stations. The City maintains the collection system with the use of two combination trucks (suction and high pressure jet cleaning hoses) and a CCTV (Closed Circuit Television) van to inspect the sewer mains and laterals. The City also provides maintenance and emergency response services for the entire sewer system.

The City updated the Wastewater Collection System Master Plan in 2010. The previous Master Plan was prepared by RBF Consulting in 2001 following the adoption of the “City of Brentwood General Plan 2021.” An updated master plan was also developed in 2006.

Sanitary sewer systems must be sized and designed to convey the PHWWF to prevent sanitary sewer overflows. A computer model is used to simulate peak flows, based on an estimate of average dry

weather flows, peaking factors, and estimates of infiltration and inflow. Average dry weather flows in the collection system are estimated using the following factors:

- Residential. 85 gallons/day/person and 2.86 persons/dwelling unit, equal to an average daily flow generation of 243 gpd/dwelling unit.
- Non-residential. 1,785 gal/day/acre, applicable to commercial, office, businesspark, and industrial uses.
- Public and semi-public facilities and schools. 895 gal/day/acre (The City of Brentwood, Wastewater Collection System Master Plan 2010).

SANITARY SEWER MANAGEMENT PLAN (SSMP)

Since 2010 there have been six small sanitary sewer overflows from the Brentwood sewer system. In May 2006, the State Water Resources Control Board (SWRCB) implemented Order No. 2006-0003-DWQ which requires, among other things, development and implementation of a system-specific SSMP. Brentwood's SSMP facilitates the overall management of the City's wastewater collection system. The SSMP is audited every two years and was revised in 2015.

The main goal of the SSMP is to minimize the number and impact of Sanitary Sewer Overflows (SSOs). Other goals include:

- Maintain the existing infrastructure and plan for future CIP projects.
- Continue to provide capacity evaluation for the collection system and plan for future growth.
- Develop a plan to ensure an adequate number of staff to meet the obligations of the SSMP.
- Prevent public health hazards.
- Detect and reduce Inflow and Infiltration into the system.
- Operate in a safe and efficient manner.

In the case of an SSO, a response plan has been prepared to protect public health and the environment, and to satisfy regulatory agencies and waste discharge permit conditions which address procedures for managing sewer overflows and minimizes risk of enforcement actions against the City of Brentwood.

PLANNED FUTURE INFRASTRUCTURE

As the City of Brentwood continues to develop in the future, there will be an increased need for water and wastewater services, including a reliable source of recycled water. These needs have been addressed in the City's master plans and will require that the City continue to implement phased improvements to some pump stations, sewer mains, and the wastewater treatment plant when triggered by growth.

Wastewater infrastructure improvements currently included in the City's Capital Improvement Program (FY 2016/17 - 2020/21) are:

- Apple Hill Drive Sewer Diversion (Apple Hill Drive to Wildcat Lane)

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- City Wide Wastewater Rehabilitation
- Marsh Creek Sewer Constriction Upgrade (north of Sunset Road, between sewer manholes 2450 and 2462)
- Wastewater Treatment Plant Effluent Chloride Compliance (2251 Elkins Way)
- Wastewater Treatment Plant Expansion - Phase II (east of Marsh Creek and north of Sunset Road)

The Wastewater Treatment Plant Phase II Expansion project design is currently underway and is expected to be complete by December 2017. The timing of construction depends on approval of a State Revolving Fund (SRF) loan and the flow. The original project was based on 100 gallons per day per capita flow. The expansion project is designed for 69 gallons per capita per day flow, and the new plant is rated as 6.4 MGD, which is adequate to serve the built out population per the General Plan. The project includes the addition of one diffused air oxidation basin, retrofit of existing oxidation ditches to diffused air, secondary clarifiers, converting chlorine contact facilities to ultra violet/free chlorine disinfection, bar screens, utility pumps, sand filters, new solids mechanical dryer, dried bio-solids storage building, electrical distribution system upgrade, and all related appurtenances.

As shown on Figure 3.1-3, existing Brentwood sewer facilities are located within the developed portions of the SPA in the northern and eastern portions of the planning area. Future projects within the SPA would be required to extend sewer services within the undeveloped portions of the SPA.

3.1.3 SOLID WASTE

The City of Brentwood is responsible for all solid waste collection within the city limits. The City owns and operates a Solid Waste Transfer Station on approximately 2.8 acres located at 2300 Elkins Way, in the northeastern area of the city. Solid waste collection in the unincorporated areas of Brentwood, outside of the city limits, is handled by a private garbage collection company, the Brentwood Disposal Service.

KEY TERMS

Class I landfill: A landfill that accepts for disposal 20 tons or more of municipal solid waste daily (based on an annual average); or one that does not qualify as a Class II or Class III municipal solid waste landfill.

Class II landfill: A landfill that (1) accepts less than 20 tons daily of municipal solid waste (based on an annual average); (2) is located on a site where there is no evidence of groundwater pollution caused or contributed by the landfill; (3) is not connected by road to a Class I municipal solid waste landfill, or, if connected by road, is located more than 50 miles from a Class I municipal solid waste landfill; and (4) serves a community that experiences (for at least three months each year) an interruption in access to surface transportation, preventing access to a Class I landfill, or a community with no practicable waste management alternative.

Class III landfill: A landfill that is not connected by road to a Class I landfill or a landfill that is located at least 50 miles from a Class I landfill. Class III landfills can accept no more than an average of one ton daily of ash from incinerated municipal solid waste or less than five tons daily of municipal solid waste.

Transfer station: A facility for the temporary deposition of some wastes. Transfer stations are often used as places where local waste collection vehicles will deposit their waste cargo prior to loading into larger vehicles. These larger vehicles will transport the waste to the end point of disposal or treatment.

Waste Management Plan: A Waste Management Plan (WMP) is a completed WMP form, approved by the City for the purpose of compliance with Chapter 8.40 of the Brentwood Municipal Code, submitted by the applicant for any covered project. Prior to project start, the WMP shall identify the types of construction and demolition (C&D) debris materials that will be generated for disposal and recycling. A completed WMP contains actual weight or volume of the material disposed recycled receipts.

REGULATORY FRAMEWORK

FEDERAL

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to address the huge volumes of municipal and industrial solid waste generated nationwide. After several amendments, the current Act governs the management of solid and hazardous waste and underground storage tanks (USTs). RCRA was an amendment to the Solid Waste Disposal Act of 1965. RCRA has been amended several times, most significantly by the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA is a combination of the first solid waste statutes and all subsequent amendments. RCRA authorizes the Environmental Protection Agency (EPA) to regulate waste management activities. RCRA authorizes states to develop and enforce their own waste management programs, in lieu of the Federal program, if a state's waste management program is substantially equivalent to, consistent with, and no less stringent than the Federal program.

STATE

California Integrated Waste Management Act (AB 939 and SB 1322)

The California Integrated Waste Management Act of 1989 (AB 939 and SB 1322) requires every city and county in the state to prepare a Source Reduction and Recycling Element to its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory state waste diversion goals of 25% by 1995 and 50% by 2000. The purpose of AB 939 and SB 1322 is to “reduce, recycle, and re-use solid waste generated in the state to the maximum extent feasible.” The term “integrated waste management” refers to the use of a variety of waste management practices to safely and effectively handle the municipal solid waste stream with the least adverse impact on human health and the environment. The Act has established a waste management hierarchy, as follows: Source Reduction; Recycling; Composting; Transformation; and Disposal.

California Integrated Waste Management Board Model Ordinance

Subsequent to the Integrated Waste Management Act, additional legislation was passed to assist local jurisdictions in accomplishing the goals of AB 939. The California Solid Waste Re-use and Recycling Access Act of 1991 (§42900-42911 of the Public Resources Code) directs the California Integrated Waste Management Board (CIWMB) to draft a “model ordinance” relating to adequate areas for collecting and loading recyclable materials in development projects. The model ordinance requires that any new development project, for which an application is submitted on or after September 1, 1994, include “adequate, accessible, and convenient areas for collecting and loading recyclable materials.” For subdivisions of single family detached homes, recycling areas are required to serve only the needs of the homes within that subdivision.

LOCAL

Brentwood Municipal Code, Chapter 8.16: Solid Waste

Chapter 8.16 of the Brentwood Municipal Code contains specific requirements related to:

- Pre-collection and storage of solid waste,
- Waste ownership and responsibilities,
- Waste collection,
- Waste disposal, and
- Solid waste handling

Brentwood Municipal Code, Chapter 8.40: Construction and Demolition Debris Recycling

In 2003, the City adopted an ordinance to require developers of projects over \$75,000 in value to recycle at least 50% of their waste stream. The ordinance was adopted in order to assist the City in meeting the waste diversion requirements mandated by AB 939. The adopted ordinance is included as Chapter 8.40 of the Brentwood Municipal Code.

Chapter 8.40 of the Brentwood Municipal Code contains specific requirements related to the applicable thresholds for projects covered by the ordinance and the requirements for the preparation, submission, and implementation of project-specific waste management plans (WMPs). Any construction, demolition, and renovation projects within the city, the total costs of which are, or are projected to be, greater than or equal to seventy-five thousand dollars or which involve construction and demolition (“covered projects”) shall comply with Section 8.40.020(A). For the purposes of determining whether a project meets the foregoing threshold, all phases of a project and all related projects taking place on a single or adjoining parcels, as determined by the WMP compliance official, shall be deemed a single project. The applicant must submit documentation to the WMP official along with a completed WMP that demonstrates that the diversion requirement for the project has been met in order to receive final occupancy approval or final of demolition permits.

Brentwood General Plan

The Brentwood General Plan includes the following goals and policies related to solid waste:

Infrastructure Element:

Goal IF 5: Ensure adequate and environmentally responsible waste disposal and recycling services

Policy IF 5-1: Provide adequate waste disposal, recycling, and reuse services, including programs that improve public access to solid waste collection and recycling facilities.

Policy IF 5-2: Reduce the amount of waste requiring disposal at landfills and increase recycling and reuse among residents, businesses, and City departments, as set forth in the City’s Source Reduction and Recycling Element.

Policy IF 5-3: When feasible, minimize the potential impacts of waste collection, transportation, and the location of potential disposal facilities upon the residents of Brentwood.

Policy IF 5-4: Locate waste collection, transfer, and processing facilities in areas that minimize impacts to the surrounding community.

Policy IF 5-5: Coordinate with Contra Costa County on any future plans to establish new landfill sites within the county in order to minimize potential adverse impacts to the Brentwood community.

Policy IF 5-6: Participate with Contra Costa County to implement a hazardous materials collection and disposal program.

ENVIRONMENTAL SETTING

Waste Collection Services

The Solid Waste Division of the City of Brentwood Public Works Department provides garbage, yard waste, and recycling collection services to residents and businesses within the Brentwood City limits. Residential garbage, yard waste, and recycling collection occurs Monday through Friday. Residential garbage is collected once per week, while yard waste and recycling are collected every-other week on an alternating schedule. Residential solid waste collection fees are based on the garbage cart size selected by the customer (32 gallon, 64 gallon, or 96 gallon), and may include up to two each of the recycling and yard waste carts, which are serviced every other week at no additional charge.

Commercial customers can establish a customized garbage collection schedule that includes a range of container sizes and collection frequencies. Commercial customers using cart services (garbage cans) can arrange for multiple service pickups per week. Commercial front-load bins ranging in size from 1 yard to 40 yards are also available for garbage, mixed recyclables, and cardboard only. Commercial and residential customers can also arrange for extra non-scheduled waste pickup services from the City at an additional charge.

WASTE DISPOSAL FACILITIES

Brentwood Transfer Station

The City of Brentwood owns and operates a solid waste transfer station with a permitted capacity to handle 400 tons per day of municipal solid waste (MSW). The transfer facility is located on approximately 5.7 acres at 2300 Elkins Way, in the northeastern area of the city. The transfer station is permitted to accommodate up to 225 incoming refuse & hauling vehicles; (induces outgoing transfer trucks), and on public clean-up days, up to 700 vehicles/day.

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 presently disposes and/or processes MSW (garbage, recycling, and green waste) at the Keller Canyon County Landfill within the City of Pittsburg, operated by Allied Waste Systems Republic Services. On March 11, 2008, by Resolution No. 2008-65, the City Council approved an Agreement with the Keller Canyon Landfill Company for Solid Waste, Green Waste and Recyclable Materials Transport, Processing and Disposal Services and a Guaranty Agreement with Allied Waste Services of North America.

The City operates a 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 Brentwood transfer station is not used to collect, store, or process household

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

hazardous waste, other than the limited quantities that may be inadvertently picked up in City collection trucks. City collection crews have primary responsibility for inspecting loads prior to transferring into collection trucks.

Keller Canyon County Landfill

The Keller Canyon Landfill opened on May 7, 1992 as a Class II Landfill operating under permit number 07-AA-0032. The facility accepts municipal solid waste, non-liquid industrial waste, contaminated soils, ash, grit, and sludges. Keller Canyon Landfill is closed to the public.

Keller Canyon Landfill covers 1,399 acres of land; 244 acres are permitted for disposal. As of 2015, the site currently handles approximately 3,000 tons of waste per day, although the permit allows up to 3,500 tons of waste per day to be managed at the facility. According to the CalRecycle Solid Waste Facility Permit (07-AA-0032), as of October of 2014 the remaining capacity of the landfill's disposal area was 55,984,431 cubic yards, and the estimated closing date for the landfill is 2050.

Recently Keller Canyon Landfill has proposed to modify the existing conditions to increase the current maximum daily tonnage limit for disposal from 3,500 to 4,900 tons per day (TPD).

HAZARDOUS WASTE DISPOSAL

The City of Brentwood maintains contractual agreements with the Delta Diablo Sanitary District to provide household hazardous waste collection and disposal services in the city. Household hazardous waste generated in Brentwood can be taken to the Delta Household Hazardous Waste Collection Facility, located at 2550 Pittsburg-Antioch Hwy, in Pittsburg. The facility is available to the residents of the following east Contra Costa County communities: Antioch, Bay Point, Bethel Island, Brentwood, Byron, Discovery Bay, Knightsen, Oakley, and Pittsburg. State regulations limit the transportation of HHW to 15 gallons or 125 pounds per vehicle per visit. Individual containers are limited to a 5-gallon capacity. There are no limitations on the number of trips per day.

The following types of hazardous waste are not accepted at the facility: appliances, asbestos, compressed gas cylinders (except propane and helium), infectious or biologically active materials, radioactive materials, railroad ties or treated wood, tires, explosives, or ammunition.

Annual hazardous waste drop-off events are scheduled throughout east Contra Costa County on various Saturdays throughout the year. These events are open to all east county residents who present a valid driver's license.

SOLID WASTE GENERATION RATES AND VOLUMES

The California Department of Resources Recycling and Recovery (CalRecycle) tracks and monitors solid waste generation rates on a per capita basis. Per capita solid waste generation rates and total annual solid waste disposal volumes for the City of Brentwood between 2010 and 2015 are shown in Table 3.1-5 below.

As shown in Table 3.1-5, both the per capita waste generation rate and the total annual disposal tonnage in Brentwood has increased during 2015 when compared to the previous five years trending from 2010 through 2014, however the city is still under the target rates set by CalRecycle.

TABLE 3.1-5: SOLID WASTE GENERATION RATES

YEAR	WASTE GENERATION RATE (LBS/PERSON/DAY)	TOTAL DISPOSAL TONNAGE (TONS/YEAR)
2010	3.3	31,326.01
2011	3.1	29,608.95
2012	3.1	29,679.19
2013	3.2	31,394.00
2014	3.3	33,362.20
2015	3.5	35,698.12

SOURCE: [HTTP://WWW.CALRECYCLE.CA.GOV/LGCENTRAL/REPORTS/JURISDICTION/REVIEWREPORTS.ASPX](http://www.calrecycle.ca.gov/LGcentral/Reports/Jurisdiction/ReviewReports.aspx) ACCESSED
DECEMBER 2016.

In accordance with AB 939, which required municipalities to aggressively pursue MSW source reduction and recycling, the City continues to meet and exceed all AB 939 goals. 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 policies.

FUNDING

The City's solid waste collection services operate as an enterprise fund. An enterprise fund establishes a separate accounting and financial reporting mechanism for municipal services for which a fee is charged in exchange for goods or services. Under enterprise accounting, the revenues and expenditures of services are separated into separate funds with their own financial statements, rather than commingled with the revenues and expenses of all other government activities. The City's General Fund is not used for solid waste collection service costs. The revenues generated from service collection fees adequately fund the operation of the City's transfer station and Solid Waste Division operations, including solid waste collections.

3.1.4 ELECTRICITY, NATURAL GAS, AND CABLE SERVICES REGULATORY FRAMEWORK

STATE

Public Utilities Commission

The California Public Utilities Commission (PUC) is the primary State agency that regulates privately owned public utilities in California. These utilities include telecommunications, electricity, natural gas, water, railroad, rail transit, and passenger transportation companies. A primary role of the PUC is to authorize utility rate changes. It also establishes service standards and safety rules, monitors the safety of utility and transportation operations, prosecutes unlawful marketing and billing activities, and oversees the merger and restructure of utility corporations.

Bioenergy Action Plan – Executive Order #S-06-06

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower, and directs State agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20% of its biofuels within California by 2010, 40% by 2020,

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and 75% by 2050. The executive order also calls for the State to meet a target for use of biomass electricity, including biomass cogeneration facilities.

Senate Bill 14 and Assembly Bill 64

Prior to the passage of SB 14 and AB 64 in 2009, California law required investor-owned utilities (IOUs) and energy service providers (ESPs) to increase their existing purchases of renewable energy by 1% of sales per year such that 20% of their retail sales, as measured by usage, are procured from eligible renewable resources (including biomass cogeneration) by December 31, 2010. This is known as the Renewable Portfolio Standard (RPS).

SB 14 and AB 64 require IOUs, POUs, and ESPs to increase their purchases of renewable energy such that at least 33% of retail sales are procured from renewable energy resources by December 31, 2020. For IOUs and ESPs, this is required only if the PUC determines that achieving these targets will result in just and reasonable rates.

Title 24

Title 24, Part 6, of the California Code of Regulations is also known as California’s Energy Efficiency Standards for Residential and Nonresidential Buildings. Title 24 was established in 1978 in response to a legislative mandate to reduce California’s energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2008 Energy Efficiency Standards went into effect on January 1, 2010. Title 24, Part 11, of the California Code of Regulations establishes the California Green Building Standards Code (CalGreen). Initially, the code requirements were voluntary; however, CalGreen became mandatory in 2011. CalGreen addresses five areas of green building: 1) planning and design, 2) energy efficiency, 3) water efficiency and conservation, 4) material conservation and resources efficiency, and 5) environmental quality. The mandatory requirements are separated into non-residential and residential projects. CalGreen also includes two optional tiers: Tier 1 and Tier 2. The tiers employ higher thresholds that jurisdictions may adopt or that projects may meet voluntarily.

LOCAL

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following policies related to electricity, natural gas, and sable services:

Conservation and Open Space

Goal COS 9: Promote conservation of energy and other natural resources

Policy COS 9-1: Require all new public and privately constructed buildings to meet and comply with the most current “green” development standards in the California Code of Regulations (CCR), Title 24.

Policy COS 9-2: Support innovative and green building best management practices including, but not limited to, LEED certification for all new development, and encourage project applicants to exceed the most current “green” development standards in the California Code of Regulations (CCR), Title 24, if feasible.

Policy COS 9-3: Promote the use of alternative energy sources in new development.

Policy COS 9-4: Incorporate innovative green building techniques and best management practices in the site design, construction, and renovation of all public projects.

EXISTING SETTING

The Pacific Gas and Electric Company (PG&E) provides electrical and natural gas service to residences and businesses throughout the city of Brentwood. As a privately owned public utility, PG&E has a service area that covers most of northern and central California. PG&E generates electric power from many sources, including hydroelectric powerhouses, a nuclear power plant (Diablo Canyon), and a few small fossil-fired power plants. PG&E also purchases power from independent power producers; generation sources from these producers can range from large fossil power plants to smaller renewable and cogeneration plants. After the power is produced or bought, it goes into PG&E's electric transmission and distribution systems to get to the homes and businesses of PG&E's customers.

Infrastructure to deliver electricity and natural gas throughout Brentwood is currently in place. PG&E generally can provide these services to newer development on request. Within the Specific Plan Area, PG&E gas utilities are located along the western portion of the planning area, and natural gas, electricity, and fiber optic cables are located throughout the developed portions of the Plan area.

3.2 PUBLIC SAFETY SERVICES

This section addresses the provision of public safety services in the city of Brentwood, including fire protection, law enforcement, and other local safety provisions.

3.2.1 FIRE PROTECTION

The City of Brentwood receives fire protection from the East Contra Costa Fire Protection District (ECCFPD).

REGULATORY FRAMEWORK

STATE

California Occupational Safety and Health Administration

In accordance with California Code of Regulations Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment," the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

Office of Emergency Services

The State of California passed legislation authorizing the Office of Emergency Services (OES) to prepare a Standard Emergency Management System (SEMS) program, which sets forth measures by which a jurisdiction should handle emergency disasters. Non-compliance with SEMS could result in the State withholding disaster relief from the non-complying jurisdiction in the event of an emergency disaster.

LOCAL

City of Brentwood General Plan

The Brentwood General Plan includes the following goals and policies related to public safety:

Community Services and Facilities Element:

Goal CSF 4: Ensure the provision of high quality and responsive fire protection services

Policy CSF 4-1: Encourage and support the East Contra Costa Fire Protection District and providers of emergency medical services to maintain adequate staff and equipment to provide high quality and responsive fire protection and emergency medical services to existing and future growth in Brentwood.

Policy CSF 4-2: Encourage, and work cooperatively with, the East Contra Costa Fire Protection District and providers of emergency medical services to maintain a three to five minute response time for all emergency response calls within Brentwood.

Policy CSF 4-3: Support efforts to improve fire protection and emergency medical services through organizational changes, if such changes would result in a significant improvement in fire protection and emergency medical services provided to Brentwood.

Policy CSF 4-4: Design and maintain roadways in such a way so as to maintain acceptable emergency vehicle response times.

Policy CSF 4-5: Ensure that new development is designed, constructed, and equipped consistent with the requirements of the California Fire Code in order to minimize the risk of fire.

Policy CSF 4-6: Ensure that new development is served with adequate water volumes and water pressure for fire protection.

FIRE PROTECTION SERVICES

The East Contra Costa Fire Protection District, which was formed in 2002, provides suppression, dispatches emergency services for a 250-mile area (including Brentwood), and is the second largest fire service area in the County. The ECCFPD provides firefighting personnel and emergency medical service (basic life support) to the residents and businesses in Bethel Island, Brentwood, Byron, Discovery Bay, Knightsen, Marsh Creek, Morgan Territory, and Oakley. The ECCFPD was formed as a consolidation of three fire districts. The ECCFPD 2016 to 2017 fiscal year budget (\$14 million) funds 42 personnel under 3 divisions.

Operations Division

The largest Division within the East Contra Costa Fire Protection District is the Fire Suppression (Operations) Division. It is responsible for emergency medical services (EMS), fire suppression, rescue, hazardous conditions, and all other emergency and non-emergency calls for service.

The Operations Division is responsible for ensuring that the citizens are served through an efficient and effective system of services designed to protect life, environment, and property. Part of this system includes staffing and maintaining three fire stations located in all of the district's major regions.

More than 75% of the calls for service are responses to medical emergencies. Firefighting related calls equal 10% of the overall responses. The remaining calls range from hazardous material responses, to rescues, and public assist requests.

The Fire Suppression element of the Operations Division is divided into three platoons; A, B, & C Shifts. These Shifts are supervised by a Battalion Chief who reports directly to the Fire Chief. The Fire District personnel assigned to these shifts consist of Fire Captains, Fire Engineers, and Firefighters. These people are a highly professional, trained force of men and women who respond to approximately 6,000+ calls-for-service annually.

Each fire protection district earns a rating from the Insurance Service Office (ISO). This rating, known as a Public Protection Classification (PPC), is utilized by many insurance providers to calculate insurance premiums within the district. Ratings range from 1 to 10. Class 1 generally represents superior property fire protection, and Class 10 indicates that the area's fire-suppression program does not meet ISO's minimum criteria.

The PPC ratings are calculated on the following factors:

- Fire alarm and communication systems, including telephone systems, telephone lines, staffing, and dispatching systems;
- The fire department, including equipment, staffing, training, and geographic distribution of fire companies; and

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- The water-supply system, including the condition and maintenance of hydrants, and a careful evaluation of the amount of available water compared with the amount needed to suppress fires.

ECCFPD, within the Brentwood city limits, presently has an Insurance Service Office (ISO) rating of four (4).

Training Division

The Training Division is responsible for the delivery of training programs for the professional development of Fire District employees. The Division prepares the employees to provide an effective response force to mitigate emergencies and potential emergencies. The Division's programs include professional development, automatic and mutual aid training, communications management, and occupational safety.

Training activities are scheduled on a daily basis. The Division's Chief in charge of training administers the scheduling and delivery of training. The District strives to deliver a wide range of training, which includes State and Federally mandated topics, as well as discretionary subjects.

Public Education Division

The Public Education Division of the East Contra Costa Fire Protection District is responsible for providing the public with information and resources to prevent not only fires, but also to reduce or prevent injuries and death from causes unrelated to fire. Each year the ECCFPD firefighters are dispatched to more emergency medical service calls for unintentional injuries than for actual fire-related emergencies.

Fire Prevention Bureau

The East Contra Costa Fire Prevention Bureau has the responsibility and authority to enter, investigate, and perform routine fire inspections of all buildings, structures, and properties in the District with the exception single and multi-family dwellings in which the owner of the property resides.

The Bureau's primary responsibility is enforcement of the Uniform Fire Code and other local fire safety regulations. This includes the inspection of all Life Hazard Use Properties (i.e., gas stations, schools, nursing homes, daycare facilities, auto repair/auto body shops, places of assembly, and large retail operations) and the inspection of Non-Life Hazard businesses, offices, and multi-family residences.

Additional duties of the Fire Prevention Bureau include: complaint investigations, fire safety permit control, issuance of violation and penalty notices for failure to comply with the law, and Fire Prevention Week activities.

FIRE STATIONS

The ECCFPD currently operates four fire stations within its service area, as shown on Figure 3.2-1.

- Station 52, at 201 John Muir Parkway, Brentwood
- Station 59, at 1685 Bixler Road, Discovery Bay
- Station 93, at 530 O'Hara Avenue, Oakley
- Station 94, at 15 A-Street, Knightsen¹

Station 54, at 739 First Street in Brentwood, is currently closed, but may be open on July 1, 2017.

¹ This station is currently open as of May 2017, but may be closed on July 1, 2017.

The city of Brentwood is served primarily by Station 52, located approximately two miles south of the Specific Plan Area. According to the District, in June 2016, Engine 52 (Brentwood) ran 31 percent of the calls for service, rolling out of the station 245 times.

In the calendar year 2015, the District ran 6,918 calls for service with an average response time of 7:54 compared to calendar year of 2014, where the District ran 6,550 calls for service with an average response time of 7:21.

For the year 2015, the average response for the Brentwood Service Area was 7:39 for the western portions of the city and 7:42 for the eastern portions of the city.

The following ECCFPD Stations have been closed for operation over the last several years due to budget constraints:

- Station 54, at 739 First Street, Brentwood - Closed September 2014
- Station 57, at 3024 First Street, Byron - Closed July 2010
- Station 58, at 1535 Discovery Bay Boulevard, Discovery Bay - Closed July 2010
- Station 95, at 3045 Ranch Lane, Bethel Island - Closed July 2012

3.2.2 LAW ENFORCEMENT

The Brentwood Police Department provides law enforcement and police protection services throughout the city. The department is located at 9100 Brentwood Boulevard approximately 3 miles southeast of the Specific Plan Area.

POLICE PROTECTION SERVICES

Established in 1948, the Brentwood Police Department is a full service law enforcement agency that is charged with the enforcement of local, State, and Federal laws, and with providing 24-hour protection of the lives and property of the public. The Police Department functions both as an instrument of public service and as a tool for the distribution of information, guidance, and direction.

The Brentwood Police Department services an area of approximately 14 square miles. The city is divided up into four separate, geographical beats, as shown in Figure 3.2-2. The department currently has 66 sworn police officers and another 30 civilian support staff. In addition to permanent staff, the department has approximately 20 volunteers who are citizens of the community and assist with our day to day operations. As described in the Brentwood Police Department's 2015 performance report, in 2015 the Brentwood Police Department handled 34,553 events/calls for service.

Field Operations Division

The Field Operations Division is one of the Police Department's two divisions. The Field Operations Division is responsible for front line law enforcement services. The Field Operations Division command staff consist of a Captain who oversees the Field Operations Division, two Field Lieutenants who are the day and evening Watch Commanders, six Field teams that are responsible for calls for service, the Traffic Safety Unit, the School Resource Officers assigned to the schools, the K-9 Unit, the Field Training Officer Program, Community Service Officers deployed in the field as support staff, and S.W.A.T.

Personnel assigned to the Field Operations Division are tasked with carrying out the Brentwood Police Department's mission of protecting and enhancing the quality of life in the community through uncompromised dedication, professionalism, integrity, and innovative police services. In this effort, and in alignment with the Brentwood Police Department's Strategic Plan, the Field Operations Division is

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working to keep the City of Brentwood and the people in the community safe from harm, and to maintain their quality of life. The Field Operation Division's priorities are to reduce crime, improve traffic safety, and build community partnerships. The Field Operations Division is a highly responsive Field force that is visible in the community and conducts aggressive, proactive law enforcement activity in the community.

Support Services Division

The Support Services Division is commanded by a Captain and has two Bureaus, Administration and Investigations, each directed by a Lieutenant. The Administration Bureau responsibility includes records, emergency services, recruiting and hiring, training, special projects, special event coordination, financial accounting, and crime prevention services. The Investigations Bureau includes major crimes and special operations investigation units, City planning liaison, the property unit, and the Chaplain's program.

The Support Services Division provides support and assistance to the Field Operations Division in order to ensure that officers in the field can provide the highest quality service to residents. The detectives provide expertise to patrol and follow-up on major cases such as domestic violence, homicides, robberies, and other crimes of violence. Detectives also initiate their own investigations especially in the areas of narcotics, vice, child abuse, and sex crimes. The records personnel staff the front counter and provide document processing for the entire Department. Records staff are usually the people who answer the phone when a citizen calls into the Police Department. The property unit maintains found property, property held for safekeeping and as evidence. The training sergeant is responsible for recruiting and facilitating the hiring of all department personnel providing the best people for the Brentwood Police Department.

Traffic Unit

The Police Department's Traffic Safety Unit (TSU) was developed in 1997 and provides an important role toward reducing fatal and injury traffic collisions in Brentwood. The TSU unit is currently comprised of three officers and a Sergeant. The TSU's mission is to make Brentwood's roadways safer for all vehicles, bicyclists, and pedestrians. The Officers in the TSU are responsible for investigating traffic collisions, issuing traffic citations, and responding to traffic complaints.

The TSU is also involved in traffic education programs, commercial vehicle enforcement, and participate in special enforcement campaigns. Some of the campaigns include: Click It or Ticket, Avoid the 25 (DUI enforcement) and VSET (Stolen Vehicle Task Force).

Neighborhood Watch Program

Neighborhood Watch is a community-law enforcement partnership and crime prevention program. Through this partnership, Brentwood residents learn how to improve their safety, the security of their property, and foster new relationships with their neighbors and members of the Brentwood Police Department. The Neighborhood Watch Program is one aspect of community policing that focuses on crime prevention, public education and awareness, and community problem solving techniques. This community-law enforcement partnership balances reactive police responses to calls for service with proactive problem solving that focuses on quality of life issues. It is the goal of the Neighborhood Watch Program to empower the community, enhance personal and residential safety, maintain open lines of communication with the Police Department, and improve the quality of life in the City of Brentwood.

School Resource Officer Program

Currently, there are two police officers assigned as School Resource Officers (SRO's). Additionally, there is one officer assigned as the Youth Liaison Officer. The primary function of the SRO's is building relationships with school officials and students to maintain a safe learning environment for students. This is accomplished by the SRO's being highly visible on the campuses, especially when the students are out of class, such as before and after school and during the lunch hours. The SRO's handle police calls for service on the campuses and work with the schools and the students in identifying potential problems.

The Youth Liaison Officer is responsible for a number of juvenile related programs within the Police Department and the City. These include the Police Activities League, which operates after school as a daycare at the three middle schools as well as other programs and activities for youth such as: Juvenile Diversion, a program for first time youth offenders; the Police Explorers Program, for youth interested in law enforcement; and Liaison for the City's Youth Commission.

CRIMES BY CATEGORY IN BRENTWOOD

Statistics on the number of crimes by category of crime in Brentwood during each year from 2010 to 2015, as reported by the Federal Bureau of Investigation (FBI) Criminal Justice Information Services Division, are shown in Table 3.2-1 below. As shown in Table 3.2-1, between 2014 and 2015, violent crime increased by 70 incidents, or 14.7%. Brentwood experienced increases in rapes, arsons, and assaults. The bulk of the increase (58 incidents) was due to a rise in simple assaults. Property crime increased by 38 incidents, or 3%. The increase is due to the increases in non-residential burglaries, theft, and auto theft. However, residential burglaries dropped by 25%.

TABLE 3.2-1: CRIMES BY CATEGORY

CATEGORY	2010	2011	2012	2013	2014	2015
Violent Crimes	490	445	623	484	472	538
Homicide	0	0	1	0	0	0
Rape	6	12	4	11	8	17
Robbery	41	46	42	20	49	43
Aggravated Assault	65	60	52	58	45	50
Simple Assault	378	329	524	395	370	428
Property Crimes	1,117	1,080	1,185	1,214	1,250	1,288
Burglary	214	249	240	253	177	158
Larceny-Theft	796	771	835	848	954	985
Vehicle Theft	107	60	110	113	119	145
Arson	21	18	11	5	3	7

SOURCE: FEDERAL BUREAU OF INVESTIGATION, CRIMINAL JUSTICE INFORMATION SERVICES DIVISION, OFFENSES KNOWN TO LAW ENFORCEMENT TABLES (2010, 2011, 2012). AND BRENTWOOD PD ANNUAL REPORT 2015.

As shown in the table, the majority of crimes committed in Brentwood consist of non-violent property crimes, primarily larceny-theft. Between 2010 and 2015, there was one homicide reported in Brentwood in 2012.

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POLICE RESPONSE TIMES

Response times vary greatly depending on the size of the City and department, geographical location and levels of crime. Smaller cities usually have faster response times, due simply to the geography. Calls for service are prioritized into two general categories.

- Priority 1 calls involve an immediate threat to life or crimes that are in progress.
- Priority 2 calls are high priority but do not elevate to the level of an emergency.

In 2015, the response times to priority 1 calls increased by 5 seconds, and the response times to priority 2 calls increased by 2 seconds compared to 2014. Response times fluctuate annually, and the increase in response times to both priority 1 and priority 2 should be considered minimal. The 2015 times are at or below the average for the past 5 years as shown in Table 3.2-2 below.

TABLE 3.2-2: BRENTWOOD AVERAGE RESPONSE TIMES LISTED IN MINUTES AND SECONDS (2011 – 2015)

YEAR	PRIORITY 1 (EMERGENCY)	PRIORITY 2 (PRIORITY RESPONSE)
2011	4:48	5:46
2012	4:50	5:32
2013	4:51	5:43
2014	4:42	5:30
2015	4:47	5:32
Change 2014 to 2015	+5 Seconds	+ 2 Seconds

SOURCE: BRENTWOOD POLICE DEPARTMENT 2015 PERFORMANCE REPORT.

3.2.3 MISCELLANEOUS PUBLIC SAFETY

BRENTWOOD EMERGENCY OPERATIONS PLAN

The purpose of the Brentwood Emergency Operations Plan (EOP) is to provide a blueprint for emergency management within the city. The goal of the plan is to reduce the loss of lives and property in the event of a disaster. The EOP identifies the City's emergency planning, organization, and response policies and procedures. The EOP also addresses the integration and coordination within other governmental agencies that are required during an emergency.

The EOP is based on the functions and principles of the Standardized Emergency Management Systems (SEMS). The EOP addresses how the City will respond to extraordinary events or disasters, from preparation through recovery. A hazards analysis and probability matrix are also included in the EOP. The responsibilities of each department are identified in matrices, and are based on each identified hazard or threat. The development of departmental Standard Operating Procedures (SOPs) is discussed, including what each department will include in their SOPs.

The City's Police Department, specifically the OES Supervisor, is responsible for reviewing the entire plan on an annual basis, and coordinating revisions to the plan as required. Each department manager is responsible for reviewing its SOP on an annual basis and coordinating the revision of the procedures with the Police Department OES Supervisor. Special districts serving the City of Brentwood are responsible for following the plan and developing procedures to fulfill their directed responsibilities, to include an annual review of the entire plan.

The EOP addresses a wide spectrum of contingencies, ranging from relatively minor incidents to large-scale disasters, such as an earthquake. Some emergencies may be preceded by a buildup or warning period, providing sufficient time to warn the public and implement mitigation measures designed to

reduce loss of life, property damage, and effects on the environment. Other emergencies may occur with little or no advance warning, thus requiring immediate activation of the EOP and efficient and coordinated mobilization and deployment of resources.

The City's response to disasters is based on five phases:

1. Preparedness;
2. Increased readiness;
3. Initial response operations;
4. Extended response operations; and
5. Recovery operations.

During each phase, specific actions are taken to reduce and/or eliminate the threat of specific disaster situations. In coordination with the City Manager and Incident Commanders, the Emergency Services Coordinator will determine the phase and initiate the appropriate level of alert for response agencies, including the activation of the Emergency Operations Center as required.

MULTI-JURISDICTIONAL LOCAL GOVERNMENT HAZARD MITIGATION PLAN FOR THE SAN FRANCISCO BAY AREA

The Association of Bay Area Governments (ABAG) prepared and adopted a Local Hazards Mitigation Plan in 2005 (undated 2010). The purpose of the Plan is to serve as a catalyst for a dialogue on public policies needed to mitigate the natural hazards that affect the San Francisco Bay Area. The overall strategy of the Plan is to utilize a multi-jurisdictional effort to maintain and enhance the disaster resistance of the region, and to fulfill the requirements of the Disaster Mitigation Act of 2000 for all local governments to develop and adopt this type of plan.

COMMUNITY EMERGENCY RESPONSE TEAM (CERT)

The Community Emergency Response Team (CERT) Program educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. Using the training learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members also are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community.

The Brentwood Police Department offers CERT training for those community members interested in this type of community service. The CERT training for community groups is usually delivered in 3-hour sessions, one evening a week over a 6 week period. The training consists of the following:

- Disaster preparedness
- Disaster fire suppression
- Disaster medical operations
- Light search and rescue operations
- Disaster psychology and team organization
- Disaster simulation

3.3 PARKS AND RECREATION

Parks, trails, and recreational facilities in the City of Brentwood are managed and maintained by the Parks and Recreation Department. During the 2015/16 fiscal year the department had 24 Full-Time Positions, 150 Part-Time Positions, and 28 Contract Instructors.

REGULATORY FRAMEWORK

STATE

Quimby Act

The Quimby Act (California Government Code Section 66477) states that “the legislative body of a city or county may, by ordinance, require the dedication of land or impose a requirement of the payment of fees in lieu thereof, or a combination of both, for park or recreational purposes as a condition to the approval of a tentative or parcel map.” Requirements of the Quimby Act apply only to the acquisition of new parkland and do not apply to the physical development of new park facilities or associated operations and maintenance costs. The Quimby Act seeks to preserve open space needed to develop parkland and recreational facilities; however, the actual development of parks and other recreational facilities is subject to discretionary approval and is evaluated on a case-by-case basis with new residential development. The City has adopted park fees as allowed by the Quimby Act, as described in greater detail below.

LOCAL

Brentwood Development Impact Fee Program

The City of Brentwood Development Impact Fee Program contains the City’s capital improvement facilities fee program to pay for the required infrastructure for development. Infrastructure, including parks and recreation facilities, is developed in two major ways. New development builds it as each project is developed, or the City builds it as part of the Capital Improvement Program (CIP). The Development Fee Program evaluates planned capital improvements and associated budget cost estimates, and assigns eligible costs as fees based upon the relative demand imposed by the various types of new development. Parks and trails fees are collected from all new residential development projects in the city, and are assessed on a per-unit basis, as shown in the Adopted Brentwood Development Fee Program.

Brentwood Parks, Trails, and Recreation Master Plan

Adopted in 2002, the Parks, Trails, and Recreation Master Plan establishes the City’s goals and vision for the provision of parks, trails, and recreational facilities. The Master Plan addresses the need and demand for recreational facilities and services throughout the city, establishes standards for the development of parks, trails and facilities, and establishes implementation tools and mechanisms to implement the goals and policies established in the Master Plan. The Master Plan establishes a goal of five acres of parkland per 1,000 residents. An update to the Master Plan is underway and is expected to be complete in mid-2018.

City of Brentwood General Plan

The Brentwood General Plan includes the following goals and policies related to parks and recreation:

Community Services and Facilities Element:

Goal CSF 2: Maintain a diverse and comprehensive system of high quality parks, trails, recreation facilities, and recreational programs and services that meets the needs of all segments of the community

Policy CSF 2-1: Ensure the provision of sufficient land that is well distributed and interconnected throughout the community for parks, trails, and recreation facilities.

Policy CSF 2-2: Achieve and maintain a minimum overall citywide ratio of 5 acres of park land per 1,000 residents.

Policy CSF 2-3: Park acreage should be provided in accordance with the following standards: Neighborhood Park - 3.0 acres per 1,000 residents; and Community Park - 2.0 acres per 1,000 residents.

Policy CSF 2-4: Develop new parks, trails, and recreation facilities through developer fees in areas which are accessible and convenient to the community, prioritizing areas that are lacking these facilities.

Policy CSF 2-5: Develop and maintain a system of parks, trails, and recreation facilities to create diverse opportunities for passive and organized recreation.

Policy CSF 2-6: Uphold design, construction, implementation, and maintenance standards to ensure high quality parks, trails, and recreation facilities, programs, and services, now and into the future.

Policy CSF 2-7: Expand, renovate, and maintain high quality parks, trails, and recreation facilities, programs, and services to accommodate existing and future needs that address traditional and non-traditional recreation, active and passive recreation, wellness, historical, cultural arts, environmental education, conservation, accessibility, inclusion, diversity, safety, and new technology.

Policy CSF 2-8: Consider the effects of new development on parks, trails, and recreation facilities, programs, and services, and condition new development appropriately to ensure that the City maintains an adequate inventory and network of facilities and resources.

Policy CSF 2-9: Continue to collect development impact fees in order to fund the acquisition of parkland, construction of new facilities and resources, and maintenance of City parks, trails, and recreation facilities. The City shall ensure that park facility impact fees are collected for new development that increases demand for parks, trails, and recreation facilities.

Policy CSF 2-10: Actively promote and participate in regional coordination and planning efforts to provide quality parks, trails, and recreation facilities throughout Brentwood and the surrounding areas. The City should emphasize regional coordination to leverage funding, maintenance, and/or resources to develop a diverse range of regional recreational opportunities.

Policy CSF 2-11: Encourage the provision and dedication of parkland within future development projects in order to ensure that the City maintains an extensive network of neighborhood parks that serve all areas of the community.

Policy CSF 2-12: Through conditions of approval and/or development agreements, ensure that the development of new parks, trails, and recreation facilities occurs during the infrastructure

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construction phase of new development projects so that they are open and available to the public prior to completion of the project.

Policy CSF 2-13: Promote the development of a diverse network of parks, trails, and recreation facilities that support traditional and non-traditional recreational uses.

Policy CSF 2-14: Emphasize and prioritize public outreach and educational programs that inform the community of available parks, trails, and recreation facilities, programs, and services available in order to increase and enhance community use of these facilities, programs, and services.

Policy CSF 2-15: Continue the City’s current practice of holding public meetings and workshops for community participation and input with respect to the design of new (and/or the renovation of existing) parks, trails, and recreation facilities.

Policy CSF 2-16: Encourage community and volunteer efforts to assist in the maintenance and beautification of parks, trails, and recreation facilities in Brentwood.

Policy CSF 2-17: Encourage and maintain diverse public access to parks, trails, and recreation facilities to the greatest extent feasible.

Policy CSF 2-18: Support recreational activities, events, organized sports leagues, and other programs that serve broad segments of the community.

Policy CSF 2-19: Allow parks as a permitted use in all residential land use designations.

TYPES OF PARKS

Community parks: Community parks are generally 15 to 25 acres in size, and include areas for active sports as well as space for family and group activities, such as picnicking. Community parks are larger in size than neighborhood parks and serve to fulfill the active and passive recreational needs of multiple neighborhoods. The community park serves the needs of local neighborhoods by providing a close to home site for more active recreation that is not typically suitable or physically possible in a neighborhood park (i.e. formal sports fields and courts with night lighting). Community parks and sports parks are where most organized activities provided by the Parks and Recreation Department and various league sports are intended to occur.

Neighborhood parks: Neighborhood parks serve as the focal point of neighborhood communities, the hub for both physical and social activities in a recreational setting that should be primarily passive. Appropriately designed neighborhood parks act as “pulse points” within the city. They are spaces that develop a sense of place while at the same time evolve to reflect the neighborhood they represent. Neighborhood parks act as critical building blocks of the city’s image and assist in developing an overall sense of community and security. They also serve as critical nodes and access points in the city-wide green space network. Neighborhood parks are generally 5 to 7 acres. Amenities at neighborhood parks may include ball fields, basketball, volleyball, bocce ball, and tennis courts, small picnic areas, playground equipment, restroom facilities, water play features, and barbeques.

Sports parks: Sports parks are the largest of the park types for Brentwood’s city-wide green space network. They are intended to consolidate high use, heavily programmed sport fields, multi-use courts and large scale facilities (such as gymnasiums or aquatic centers). As such, there are typically fewer sports parks than other types of parks within a city-wide green space network; but, they are strategically located to ensure that they serve the greatest service radius possible. Siting for sports parks is critical.

Sports parks are oriented to teen and adult league sports, whereas community parks and school parks better accommodate youth sports such as T-ball. Sports park sites are generally 40 to 140 acres in size, with an average of 70 acres.

Special use parks: The “Special Use Parks” classification was developed by the City to allow for flexibility in providing recreational resources throughout the city-wide green space network. This classification is intended to accommodate special circumstances, unique site characteristics, etc. in park, trail, and recreation resources. These types of resources add diversity to the green space network and accommodate a variety of “non-traditional” recreation amenities beyond the standard neighborhood, community, and sports park classifications. At the City’s discretion, this classification may also include the typical park configurations (Neighborhood, Community, or Sports) which have been modified from the original standards, but have the same contiguous shape, size, and design elements, as well as mixed-use parks and greenways.

Greenways: Greenways are comprised of linear parks, trails, and open space. They characteristically reinforce the quality and access of the existing park resources in the neighborhood, sports, and community park categories. Greenways should be employed in a manner that supports continuous and safe alternative non-motorized transportation (i.e., biking, walking, running, and/or equestrian riding as appropriate). They can also include staging areas and the potential for pocket parks where appropriate to create an outdoor economic environment where temporary food kiosks, farmers’ markets, or parades can be staged.

TRAILS

Trails are a key factor in the development of a city-wide green space network of parks, trails, open space, and recreation facilities. To develop a successful, safe, alternative means of transportation and recreation within the city, three major components/classifications of trails are included in the City’s Parks, Trails, and Recreation Master Plan. Existing city-wide bicycle facilities managed and maintained by the City of Brentwood, and facilities proposed by the City are shown on Figure 2.0-5 in Section 3.0, Circulation, of this report. As shown on Figure 2.0-5, within the Specific Plan Area includes several proposed trails including Class 1 and Class 2 bikeways and trails, and a proposed bridge/underpass at HW-4 near the center of the Plan Area.

Park Trails: Park trails should be off-road, multi-modal trails fulfilling the following three trail types:

- Type I Park Trails: heavy use multi-modal trails with possible separators for use types.
- Type II Park Trails: lighter use multi-modal trails used often as connectors between parks or open space areas and housing developments.
- Type III Park Trails: hiking trails designed for minimum impact in natural and open space areas, particularly in critical habitat preserves.

Connector Trails: Connector trails provide safe routes to and from neighborhoods and parks. They may also be used as commuter trails when attached to public transportation routes.

- Type I Connector Trails: off-road heavy use multi-modal trails where uses are often separated within the right-of-way. Used to create linkages between park resources, housing developments, and urban areas where park trails would not exist.

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- Type II Connector Trails: off-road lighter use trails with non-separated uses, often shorter in length, with connections to housing development or urban and commercial areas from park resources.

Bikeways: Bikeways are routes used in conjunction with or adjacent to roadways. They can be an important component in commuter transportation development. Three classifications of bikeways are included in the City’s Parks, Trails, and Recreation Master Plan. They are structured to conform to Caltrans standards and Federal program funding requirements.

- Class I Bikeway: “Bike paths” provided within a completely separated right-of-way designated for the exclusive use of bicycles and pedestrians with cross flows by motorists minimized. Caltrans standards require bike paths to have a minimum paved width of eight feet and be completely separated from a street.
- Class II Bikeway: “Bike lanes” provided within a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through traffic by motor vehicles or pedestrians prohibited, but with vehicle parking and cross flows by pedestrians and motorists permitted. Caltrans standards require bike lanes to be striped with a 6-inch solid white line that provides a minimum four-foot exclusive bicycle travel lane.
- Class III Bikeway: “Bike routes” provided within the street right-of-way designated by signs or permanent markings and shared with pedestrians or motorists. Caltrans standards require Class III routes to be marked with appropriate bike route signs.

CITY PARKS

Brentwood has approximately 252.5 acres of City owned developed parkland, including 70 parks, 17 pocket parks and trailheads, and over 19 miles of multi-use trails. The City offers over 100 recreational activities and events for people of all ages and interests.

A summary of existing City parks with notable amenities, including locations and acreages is provided in Table 3.3-1. The location of parks within the City, including parks near the Specific Plan Area, are shown on Figure 3.3-1.

TABLE 3.3-1 EXISTING PARK FACILITIES

<i>PARK</i>	<i>LOCATION</i>	<i>ACREAGE</i>	<i>FACILITIES</i>
Almanor Park	555 Almanor Street	0.11	Play area, trellis, and turf.
Almond Park	2010 Azalea Way	1.39	Barbeque, basketball court, play area, grass area, five picnic tables and four benches.
Amber Park	2357 DeMartini Lane	0.28	Play area and grass area.
Anastasia Park	1774 Anastasia Drive	0.77	Pocket park features a children's play area, lawn area, and shaded picnic area.
Appaloosa Park	2413 Tamalpais Court	0.71	Play area, a grass area, one picnic table and two benches.
Apple Hill Park	1866 Central Boulevard	4.85	Baseball field, basketball court, barbeques, bike path, children’s play area, reservable picnic tables, bocce ball court, and restrooms.
Apricot Park	1875 Spanish Trail	0.25	Grass area and two picnic tables.

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<i>PARK</i>	<i>LOCATION</i>	<i>ACREAGE</i>	<i>FACILITIES</i>
Arbor View Park	817 Atherton Boulevard	5.60	Gazebo, large turf area, basketball court, volleyball court, picnic tables, and play equipment for both younger and older children. This park is known for its great variety of trees.
Balfour-Guthrie Park	1701 Balfour Road	6.43	Ballfield, barbeques, basketball courts, a bike path, children's play equipment, a turf area, reservable picnic tables (21), restrooms, overlay soccer field, tennis and volleyball courts.
Berkshire Park	2389 Berkshire Lane	0.40	Picnic tables, turf and a play area for children.
Big Basin Park	2034 Huntington Way	1.02	Picnic tables, turf and a play area for children
Black Gold Park	2671 St. Regis Avenue	6.22	Bike path, children's play area, picnic tables, and turf
Blue Goose	1765 Adams Lane	4.10	3 barbeques, play area, water features, grass area and 6 reservable picnic tables, and shade area.
Brentwood Family Aquatic Complex	195 Griffith Lane	7.00	Benches, covered area (shaded), hydraulic lift, picnic tables, pool play features, lap pool, restroom(s), shallow entry pool, vending machines, two waterslides, and concession stand.
Brentwood Skate Park	195 Griffith Lane	0.50	Skate & BMX Park features advanced, intermediate and beginner skate elements. The 18,000 sq ft facility includes rails, bowls, rollers, boxes, ledges, and picnic tables. Roller blades, skateboards and BMX bikes are welcome during certain days/times.
Caboose Park	832 Marjoram Drive	1.02	Play area, a grass area, three picnic tables and two benches.
Carrara Pocket Park		0.10	
Celeste Park	2955 Celeste Way	1.09	Play area, grass area, two picnic tables and two benches.
Chestnut Trailhead		0.10	
Cherry Park	2050 Roper Circle	0.44	Grass area, two picnic tables and two benches.
City Park	710 Second Street	2.50	Barbeques, play area, restrooms, reservable picnic tables, a performance area, a water play feature, and public art.
Cortona Park	366 Cortona Way	0.30	Bike path, play area, grass area, nine picnic tables, benches, and public art.
Cortona Trailhead		0.18	
Creekside Park	1010 Claremont Drive	6.16	Barbeques, basketball court, bike path, play area, large turf area, five picnic tables, lighted tennis courts, ballfield, and portable restroom.
Creekside Trailhead Park	349 Marino Lane	0.40	Bike path and picnic table.
Curtis Park	105 Curtis Drive	0.13	Small children's play area.
Dakota Park	480 Ridgewood Court	4.7	Two dog park areas, concrete walking path, and picnic amenities
Darby/Coventry Pocket Park		0.77	
Daytona Park	497 Milford Street	1.21	Grass area and picnic tables.
Egret Park		1.54	

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

<i>PARK</i>	<i>LOCATION</i>	<i>ACREAGE</i>	<i>FACILITIES</i>
Fiorita Pocket Park		0.10	
Fruitwood Park	1807 Moreau Way	0.42	Grass area and one picnic table.
Garin Park	231 Lawrence Lane	6.36	Large turf area, children's play area, 7 picnic tables, and two soccer fields.
Gann Street Pocket Park		0.20	Picnic table.
Gemini Park	1149 Europena Drive	0.78	Play area, grass area, two picnic tables and two benches.
Glory Park	4680 Nunn Street	1.10	Basketball court, children's play area, a turf area, and 4 picnic tables.
Granville Green Park	1091 Granville Lane	1.76	Play area, a grass area, four picnic tables, four benches and public art.
Grant Street Trailhead		0.10	
Heron Park	950 Garin Parkway	10.81	Enclosed lake surrounded by a bike path and plenty of open grass area. It is equipped with barbeques, play structures, picnic tables, and public art.
Homecoming Park	2040 Homecoming Way	2.00	Barbeques, basketball court, bike path, children's play area, a turf area, three picnic tables, and swings.
Iron Horse Trailhead		0.67	
Kaleidoscope Park	2581 Margaret Lane	0.54	Play area, one picnic table, one bench, a public art display, and a dinosaur sand box.
King Park	1379 Bauer Way	3.93	Fenced in dog play area, barbecues, basketball court, play area, picnic tables, and public art.
La Pergola Pocket Park		0.24	
Lake Park	401 Lakeview Drive	1.50	Bike path, children's play area, turf area, and three picnic tables.
Loma Vista Park	1051 Meadowgate Way	4.50	Barbeques, bike path, children's play area, a large turf area, and seven picnic tables.
Mallard Park	668 Ray Street	1.54	Picnic tables, benches, and a water feature.
Marsh Creek Staging Area	Central Boulevard	1.29	Parking lot adjacent to the Marsh Creek Trail.
Marsh Creek Trailhead Park		9.33	
Marsh Creek Vista Park	48 Pasco Drive	0.47	Turf area and three picnic tables.
McClarren Park	700 McClarren Road	3.18	Play Structure, basketball courts, picnic area, barbecue, and open grass area.
Medallion Park	1108 Europena Drive	1.34	Lawn area and one picnic table.
Miwok Park and Trail	1700 Regal Drive	10.17	Barbeques, bike path, children's play area, a large turf area, and four picnic tables.
Oak Meadow Park	180 Crawford Drive	9.68	Lighted overlay soccer fields, baseball and softball fields, barbeques, bike path, turf areas, play area, and restrooms.
Orchard Park	40 Griffith Lane	5.19	Bike path, children's play area, a large turf area and eight picnic tables.

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

<i>PARK</i>	<i>LOCATION</i>	<i>ACREAGE</i>	<i>FACILITIES</i>
Outrigger Circle Pocket Park		0.96	
Palomino Park	2293 Black Stone Drive	0.61	Play area and grass area.
Peach Park	2320 Indian Springs Drive	0.77	Play area, grass area and two picnic tables.
Pistachio Park		1.11	
Portofino Park		1.31	
Rainbow's End Park	1626 Marina Way	0.80	Lawn area, public art, and a water feature.
Rice Pocket Park		0.25	
Rolling Hills Park	773 Waterville Drive	2.05	Turf area and three picnic tables.
Rose Garden Park	2732 Cathedral Circle	3.13	Lawn area, gazebo, rose garden, and public art.
Sage Glen Park	60 Rosano Street	2.00	Barbeques, bike path, play area, grass area, picnic tables and benches.
Sawyer Pocket Park		0.22	
Seedling Park	2180 Wayne Drive	1.41	Grass area, play area, 1 barbeque, 4 picnic tables and 5 benches.
Spirit Park	4600 Ford Street	0.51	Children's play area.
Steeple Chase Park	1082 Steeple Boulevard	1.11	Barbeques, play area, grass area, picnic tables and benches.
Stonehaven Park	1320 Stonehaven Drive	0.15	Play area and turf.
Summerset Commons	1151 Fairview Avenue	13.05	Bicycle paths, benches, and vineyards.
Summerwood Park	1159 San Jose Avenue	4.49	Barbeques, a bike path, children's play area, a large turf area, and eight picnic tables.
Sungold Park	576 Sungold Court	1.71	Barbeques, picnic tables, benches, play area, and turf.
Sunset Park Athletic Complex	655 Sunset Road	39.77	6 field softball/baseball complex, 3 full-size soccer fields and 1 competition soccer field, 2 fully operating restrooms and concession stands, viewing bleachers on all softball/baseball and competition soccer field and one soccer field. Playground for children ranging from preschool through elementary school, reservable picnic areas, some with barbecues, are available. A one-mile walking path, equestrian staging area with access to Marsh Creek Trail. Complex is fully lit. Parking for 350 vehicles.
Sweetgrass Pocket Park		0.25	
Topaz park	2162 Hilda Way	0.27	Shaded play area.
Veterans Park	3841 Balfour Road	10.50	Located adjacent to the Brentwood Family Aquatics Complex, and the Brentwood Senior Activity Center, this park features covered group picnic areas (reservable), a sand volleyball court, 4 bocce courts with oyster shell surfacing, and horseshoe court. This facility also has a restroom, two children's play areas with unique play equipment (including universal abilities), a 10-foot wide walking path around the perimeter of the park, public art, and veterans monuments.

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

<i>PARK</i>	<i>LOCATION</i>	<i>ACREAGE</i>	<i>FACILITIES</i>
Walnut Park	4655 Carnegie Lane	5.05	Basketball courts, bike path, children’s area, large turf area, and five picnic tables.
Wheatfield Park	2143 Gold Poppy Street	1.34	Play area, grass area and three picnic tables.
Windsor Park	1350 Windsor Way	0.18	Basketball court, children’s play area, and one picnic table.
Yokut Park	1840 La Fonte Drive	1.33	Open turf, and features a basketball court, barbecues, two picnic tables, and a children's play area.
Other City owned parkland (no design)		20.52	
Subtotal Park Acreage		323.04	
Total City Owned Park Acreage		252.5	

SOURCE: CITY OF BRENTWOOD PARKS, TRAILS & RECREATION ANNUAL REPORT (2014/2015).

The City’s 2015 population was approximately 57,218. With 252.5 acres of parkland, the City currently provides 4.41 acres of parkland for every 1,000 people, which is slightly below the City’s goal of 5.0 acres for every 1,000 people.

In addition to the City’s currently owned parkland, 6.3 acres of parkland is currently in the design and or construction phase, and 117.14 acres are identified as Future Dedication parklands, which together will bring the total parkland within the city to approximately 375.94 acres. At the current population, this would equal approximately 6.6 acres of parkland per 1000 people, or enough park space to serve a population of 75,000, and still meet the City’s current park standard of 5 acres per 1000 people.

JOINT USE FACILITIES

The City of Brentwood maintains joint use facility agreements with the Brentwood Union School District and the Liberty Union High School District. The agreements allow the school districts to utilize City-owned facilities, and allow the City to utilize school owned facilities.

The agreement between the Brentwood Union School District and the City allow for the joint use of the following District-owned facilities by the City:

- Bristow Middle School Gymnasium/Exercise Room
- J. Douglas Adams Middle School Gymnasium/Exercise Room
- Edna Hill Middle School Gymnasium/Exercise Room/Training Room
- Garin Elementary Multi-Purpose Room*
- Marsh Creek Elementary Multi-Purpose Room*
- Pioneer Elementary Multi-Purpose Room*

*Note: The District will charge the City Group I (non-profit) rate at these locations.

The agreement between the Brentwood Union School District and the City allow for the joint use of the following City-owned facilities by the District:

- Brentwood Community Center
- Brentwood Family Aquatic Complex
- Mobile Stage
- Mobile Bleachers
- Brentwood Library
- Brentwood Senior Activity Center

The agreement between the Liberty Union High School District and the City allow for the joint use of the following District-owned facilities by the City:

- Heritage High School Gymnasium
- Heritage High School Pool
- Heritage High School Athletic Fields
- Heritage High School Sports Stadiums
- Heritage High School Tennis Courts
- Liberty High School Gymnasiums
- Liberty High School Sports Stadium

The agreement between the Liberty Union High School District and the City allow for the joint use of the following City-owned facilities by the District:

- Balfour-Guthrie Park
- Brentwood Family Aquatic Complex
- Oak Meadow Park
- Mobile Stage
- Mobile Bleachers
- Sunset Park Athletic Complex
- Brentwood Community Center
- Brentwood Library
- Brentwood Senior Activity Center

3.4 SCHOOLS, LIBRARIES, AND OTHER COMMUNITY FACILITIES REGULATORY FRAMEWORK

STATE

Leroy F. Greene School Facilities Act of 1998 (SB 50)

The “Leroy F. Greene School Facilities Act of 1998,” also known as Senate Bill No. 50 or SB 50 (Chapter 407, Statutes of 1998), governs a school district’s authority to levy school impact fees. This comprehensive legislation, together with the \$9.2 billion education bond act approved by the voters in November 1998 known as “Proposition 1A,” reformed methods of school construction financing in California. SB 50 instituted a new school facility program by which school districts can apply for State construction and modernization funds. It imposed limitations on the power of cities and counties to require mitigation of school facilities impacts as a condition of approving new development and provided the authority for school districts to levy fees at three different levels:

- Level I fees are the current statutory fees allowed under Education Code 17620. This code section provides the basic authority for school districts to levy a fee against residential and commercial construction for the purpose of funding school construction or reconstruction of facilities. These fees vary by district for residential construction and commercial construction and are increased biannually.
- Level II fees are outlined in Government Code Section 65995.5, allowing school districts to impose a higher fee on residential construction if certain conditions are met. These conditions include having a substantial percentage of students on multi-track year-round scheduling, having an assumed debt equal to 15–30% of the district’s bonding capacity (percentage is based on revenue sources for repayment), having at least 20% of the district’s teaching stations housed in relocatable classrooms, and having placed a local bond on the ballot in the past four years which received at least 50% plus one of the votes cast. A Facility Needs Assessment must demonstrate the need for new school facilities for unhoused pupils is attributable to projected enrollment growth from the construction of new residential units over the next five years.
- Level III fees are outlined in Government Code Section 65995.7. If State funding becomes unavailable, this code section authorizes a school district that has been approved to collect Level II fees to collect a higher fee on residential construction. This fee is equal to twice the amount of Level II fees. However, if a district eventually receives State funding, this excess fee may be reimbursed to the developers or subtracted from the amount of State funding.

The Kindergarten-University Public Education Facilities Bond Act of 2002 (Prop 47)

This act was approved by California voters in November 2002 and provides for a bond issue of \$13.05 billion to fund necessary education facilities to relieve overcrowding and to repair older schools. Funds will be targeted at areas of greatest need and must be spent according to strict accountability measures. Funds will also be used to upgrade and build new classrooms in the California Community Colleges, the California State University, and the University of California in order to provide adequate higher education facilities to accommodate growing student enrollment.

California Department of Education

The California Department of Education (CDE) School Facilities Planning Division (SFPD) prepared a School Site Selection and Approval Guide that provides criteria for locating appropriate school sites in the State of California. School site and size recommendations were changed by the CDE in 2000 to

reflect various changes in educational conditions, such as lowering of class sizes and use of advanced technology. The expanded use of school buildings and grounds for community and agency joint use and concern for the safety of the students and staff members also influenced the modification of the CDE recommendations.

Specific recommendations for school size are provided in the School Site Analysis and Development Guide. This document suggests a ratio of 1:2 between buildings and land. CDE is aware that in a number of cases, primarily in urban settings, smaller sites cannot accommodate this ratio. In such cases, the SFPD may approve an amount of acreage less than the recommended gross site size and building-to-ground ratio.

Certain health and safety requirements for school site selection are governed by State regulations and the policies of the SFPD relating to:

- Proximity to airports, high-voltage power transmission lines, railroads, and major roadways;
- Presence of toxic and hazardous substances;
- Hazardous facilities and hazardous air emissions within one-quarter mile;
- Proximity to high-pressure natural gas lines, propane storage facilities, gasoline lines, pressurized sewer lines, or high-pressure water pipelines;
- Noise;
- Results of geological studies or soil analyses; and
- Traffic and school bus safety issues.

LOCAL

City of Brentwood General Plan

The Brentwood General Plan includes the following goals and policies related to schools and other community facilities:

Community Services and Facilities Element:

Goal CSF 5: Enhance the quality of life for all city residents through the provision of cultural and social resources including quality schools, libraries, medical, and other community services and facilities

Policy CSF 5-1: Continue to work cooperatively with the local school districts in order to ensure that adequate facilities and educational opportunities for all students are provided in a timely manner in accordance with the pace of residential development.

Policy CSF 5-2: Continue to strongly support and encourage the maintenance of high quality schools and diverse educational opportunities in Brentwood, and work cooperatively with the local school districts to explore all local and state funding sources to secure available funding for new school facilities.

Policy CSF 5-3: Support efforts to provide continuing adult education programs.

Policy CSF 5-4: Support the provision of high quality civic, library, medical, and other community facilities in order to meet the broad range of needs within Brentwood.

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

Policy CSF 5-5: Support efforts by Contra Costa County to provide library services that meet the evolving educational and social needs of Brentwood residents.

Policy CSF 5-6: Provide an environment in which community literacy and cultural opportunities are enhanced.

Policy CSF 5-7: Pursue additional funding sources for library operations that serve Brentwood.

Policy CSF 5-8: Explore opportunities to expand library services and funding to areas within Brentwood.

Policy CSF 5-9: Work with health care providers to provide a range of health related facilities in Brentwood to meet the needs of the growing population.

Policy CSF 5-10: Promote and expand cultural, historical, and social awareness through museums, cultural heritage projects, and public art.

Policy CSF 5-11: Provide responsive and high quality City government services to residents and businesses.

Policy CSF 5-12: Continue to maximize public participation in local government actions and maintain excellent levels of City government service.

Policy CSF 5-13: Encourage citizen participation at City government meetings, hearings, and workshops.

Policy CSF 5-14: Solicit feedback from residents and citizens regarding City-initiated projects, programs, and outreach efforts.

Policy CSF 5-15: Provide information related to City services and resources to residents, businesses, and visitors through the City's website and other media, including community bulletin boards, local newspapers, direct mailings, and other appropriate methods.

Policy CSF 5-16: Encourage and support the provision of residential care facilities in accordance with State law to meet the needs of existing and future residents.

Policy CSF 5-17: Consider the needs of senior and people with disabilities when reviewing future development applications and land use plans.

Policy CSF 5-18: Encourage services and programs that meet the unique needs of seniors within Brentwood, including the establishment of medical facilities, transportation options for seniors and people with mobility disabilities, senior centers, and programs that provide for in-home care and aging-in-place.

Land Use Element

Policy LU 1-10: Schools are an allowed land use within all residential, commercial, office, and business park designations.

Policy LU 2-9: Encourage future schools to be located in areas throughout the community in close proximity to the neighborhoods they are intended to serve.

SCHOOLS

The City of Brentwood is served by the Brentwood Union School District (K-5 elementary schools and 6-8 middle schools) and the Liberty Union High School District (9-12 high schools). Table 3.4-1 provides a summary of the public schools serving the city’s population.

TABLE 3.4-1 PUBLIC SCHOOLS SERVING BRENTWOOD

SCHOOL	GRADES SERVED	ADDRESS
<i>ELEMENTARY SCHOOLS</i>		
Brentwood Elementary	K-5	200 Griffith Lane
Garin Elementary	K-5	250 1st Street
Loma Vista Elementary	K-5	2110 San Jose Avenue
Marsh Creek Elementary	K-5	601 Grant Street
Mary Casey Black Elementary	K-5	480 Farmington Drive
Pioneer Elementary	K-5	2010 Shady Willow Lane
Ron Nunn Elementary	K-5	1755 Central Boulevard
R. Paul Krey Elementary	K-5	190 Crawford Drive
<i>MIDDLE SCHOOLS</i>		
J. Douglas Adams Middle School	6-8	401 American Avenue
Edna Hill Middle School	6-8	140 Birch Street
William B. Bristow Middle School	6-8	855 Minnesota Avenue
<i>HIGH SCHOOLS</i>		
Freedom High School	9-12	1050 Neroly Road, Oakley, CA
Heritage High School	9-12	101 American Avenue
Independence High School	9-12	929 2nd Street
La Paloma High School (Continuation School)	9-12	400 Ghiggeri Drive
Liberty High School	9-12	850 2nd Street

SOURCES: CITY OF BRENTWOOD [HTTP://WWW.CI.BRENTWOOD.CA.US/LINKS/SCHOOL.CFM](http://www.ci.brentwood.ca.us/links/school.cfm) (ACCESSED DECEMBER 2016) AND CALIFORNIA DEPARTMENT OF EDUCATION, EDUCATIONAL DEMOGRAPHICS UNIT, CALIFORNIA PUBLIC SCHOOL ENROLLMENT-SCHOOL REPORT

Liberty Union High School District (LUHSD) includes three comprehensive high schools: Liberty High, Freedom High, and Heritage High. In addition, the District includes one continuation high school, La Paloma, and one alternative high school, Independence High School. According to the LUHSD, all three comprehensive high school sites were built with a 2,200 student capacity. As shown in Table 3.4-2, this capacity is currently being exceeded at all three high schools and facility needs are being met with portables. According to the Liberty Union High School District 2016 school attendance boundaries, students within the Specific Plan Area would attend Heritage High School.

3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

TABLE 3.4-2 LIBERTY UNION HIGH SCHOOL DISTRICT SCHOOL ENROLMENT (2015/2016)

SCHOOL	GRADES SERVED	ADDRESS	ENROLMENT
Freedom High School	9-12	1050 Neroly Road, Oakley, CA	2,624
Heritage High School	9-12	101 American Avenue	2,561
Independence High School (Alternative School)	9-12	929 2nd St	328
La Paloma High School (Continuation School)	9-12	400 Ghiggeri Drive	158
Liberty High School	9-12	850 Second Street	2,499

CALIFORNIA DEPARTMENT OF EDUCATION, EDUCATIONAL DEMOGRAPHICS UNIT, CALIFORNIA PUBLIC SCHOOL ENROLLMENT-SCHOOL REPORT 2015/2016

The BUSD consists of eight elementary schools and three middle schools. Collectively, the School District's school facilities in school year 2015/2016 have a capacity of 8,645 seats per Section 17071.25 of the Education Code.² Of these 8,645 seats, 6,291 are at the elementary school level and 2,354 are at the middle school level. These capacities include seats from all new school facility construction projects funded by the State. Based on student enrollment data for school year 2015/2016, the enrollment of the School District is 8,849 students. As shown in Table 3.4-3, student enrollment exceeds facilities capacity at the elementary school level, while facilities capacity exceeds student enrollment at the middle school level in school year 2015/2016.

TABLE 3.4-3: EXISTING BUSD SCHOOL FACILITIES CAPACITY AND STUDENT ENROLLMENT (2015/2016)

SCHOOL LEVEL	2015/2016 FACILITIES CAPACITY	2015/2016 STUDENT ENROLLMENT	EXCESS/ (SHORTAGE) CAPACITY
Elementary School (Grades K-6)	6,291	6,629	(338)
Middle School (Grades 7-8)	2,354	2,220	134
Total	8,645	8,849	(204)

SOURCE: BRENTWOOD UNION SCHOOL DISTRICT SCHOOL FACILITIES NEEDS ANALYSIS MAY 12, 2016

According to the Brentwood Union School District 2016 school attendance boundaries, students within the eastern portion of the Specific Plan Area (east of SR-4) would attend Pioneer Elementary, and students west of SR-4 would attend Loma Vista Elementary. All students within the Plan area would attend Adams Middle School.

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 County Library system to obtain information not found in the Brentwood Library, which has been requested by customers. The Brentwood Library is temporarily located at 35 Oak Street in the Community Center, until the new permanent library is constructed at the corner of Oak Street and Third Street. The library is open from 10 a.m. to 8 p.m. Monday through Thursday and from 10 a.m. to 6 p.m. on Fridays and Saturdays. The library collection includes materials in both Spanish and English. It also offers a wide variety of media, including DVDs, CDs and audiobooks, as well as a large print collection. The library offers a number of programs for all ages, including story times for babies and toddlers.

² The School District operates elementary schools that serve grades K-5 and middle schools that serve grades 6-8. To compare capacity and enrollment consistent with SAB Form 50-02, the School District's school level configuration has been altered.

BRENTWOOD CIVIC CENTER

The Brentwood Civic Center was constructed in 2011 and houses the City's governmental offices and provides resources and amenities for public use. The project was completed as part of the City's Downtown revitalization efforts. The Civic Center is constructed in a Mission Style architecture, and includes extensive pedestrian connectivity features, public art, historical City information, and parks and recreation facilities.

One feature of the Civic Center is the "History Walk," which was designed to reflect Brentwood's rich history and tell the story of its past. Starting at the center of the Civic Plaza and winding its way throughout the Civic Center arcade, date markers are placed to celebrate significant moments in time that are important to Brentwood's past. The walk encompasses several different components that include historical plaques along the interior walls of the arcade, inscribed concrete walkways, and wall murals.

The Civic Center also includes a wall mural, a fountain covered with a detailed mosaic tile, a children's play area with a decorative fence, a water play feature, picnic tables, benches, a statue, and a rose garden. The park at the Civic Center encompasses approximately 3.86 acres. A 280 stall public parking garage is located adjacent to the center.

The 32,000 square foot Community Center is available for public rental. The first floor has a large banquet room, opening directly on to City Park through a series of large glass doors; a full caterer's kitchen; an arts and crafts room with dedicated storage; a multi-purpose room and a lobby pre-function area with space for art displays and public gatherings. The second floor has a public conference room which can be divided into two rooms.

The buildings were constructed utilizing energy efficient building components, developed to ensure that they are environmentally sound, and earned a Silver Level Leadership in Energy and Environmental Design (LEED) certification. LEED is a nationally recognized energy savings design program.

BRENTWOOD SENIOR ACTIVITY CENTER

This facility is located at the northeast corner of Balfour Road and Griffith Lane. It serves as a multi-use facility with a main hall, small stage, dance floor, kitchen, meeting room, and classroom areas. There is a maximum auditorium seating of 300 and a serving seating of 200. The Center features a main hall with a stage, dance floor, kitchen, and large lobby area. It is an ideal space for weddings, luncheons, corporate functions, banquets, trainings, parties, and special events. A meeting/activity room is also available to accommodate smaller functions of up to 88 people. The kitchen includes a gas range/oven, refrigerator, freezer, and ice-maker. Rooms can be rented separately or together to allow extra flexibility for an event. A variety of additional amenities such as cake tables, skirting, buffet servers, and portable bar are also available. Rental hours are Monday-Friday after 6 pm, and Saturday and Sunday 8 am-1 am.

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3.0 UTILITIES, COMMUNITY SERVICES, AND FACILITIES

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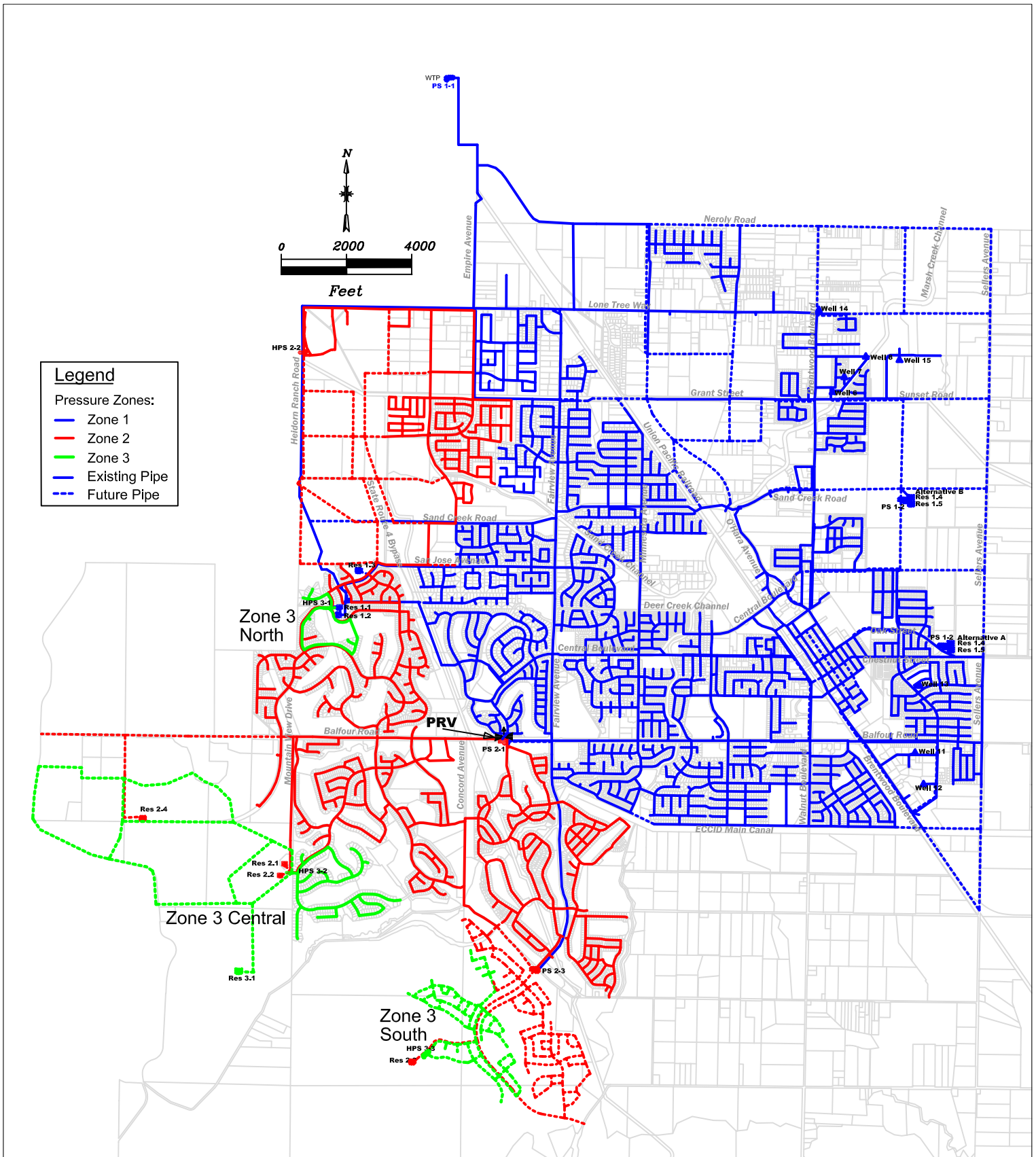
Contra Costa Clean Water Program. 2004. Contra Costa Creeks Inventory and Watershed Characterization Report.

East Contra Costa Fire Protection District. 2016. Accessed December 2016.
<http://www.eccfpd.org/index.htm>.

East Contra Costa Municipal Storm Water Permit NPDES No. CAS083313 Order No. R5-2010-0102.

Liberty Union High School District 2015/2016 Schools of Attendance Boundaries.
<http://www.schoolworksgis.com/SL/LUHSD/schoollocator.html>

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PRIORITY AREA 1 SPECIFIC PLAN AREA
 Figure 3.1-1: Potable Water System

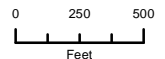
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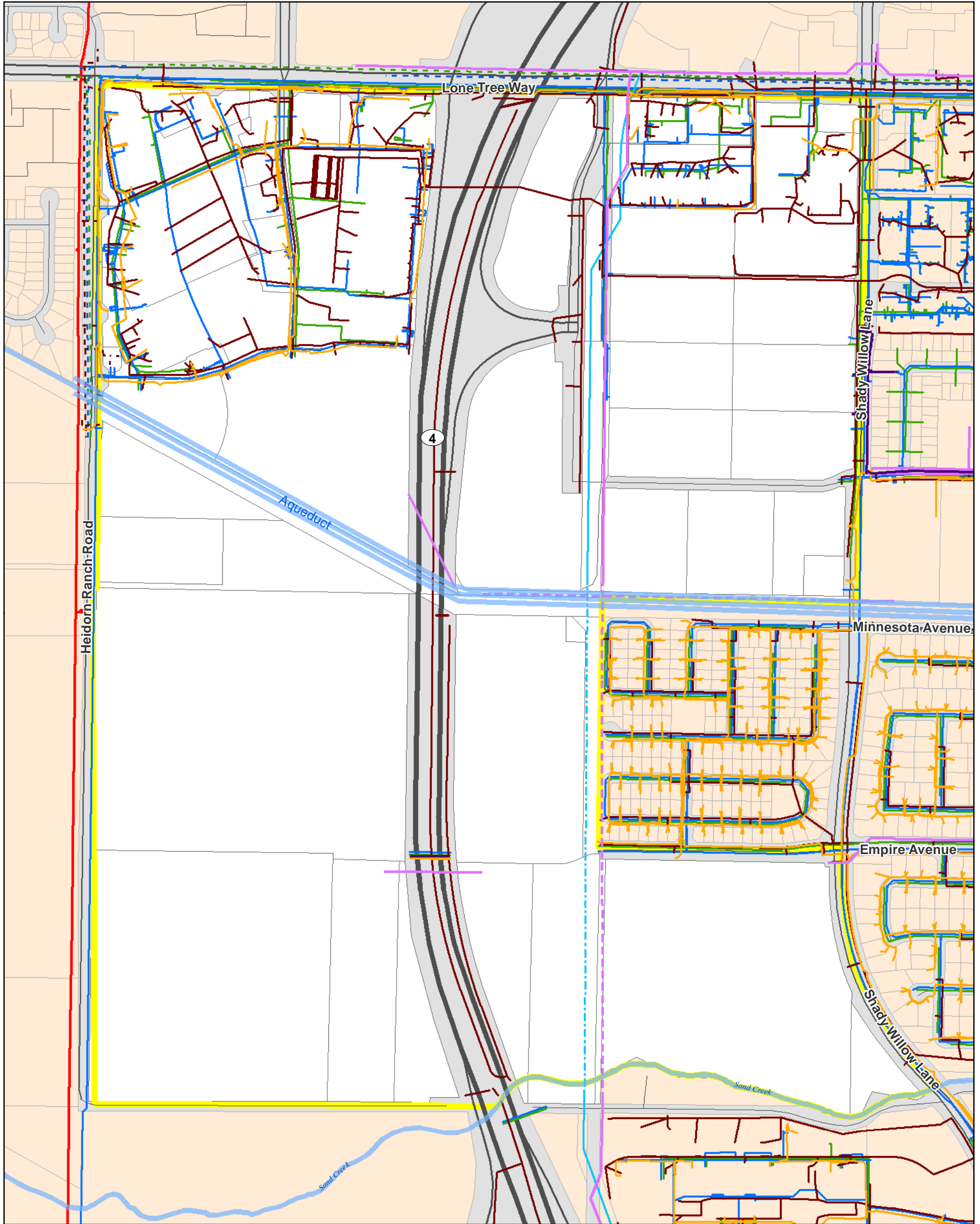
Wastewater Treatment Plant

PRIORITY AREA 1 SPECIFIC PLAN AREA

Figure 3.1-2: City of Brentwood Wastewater Treatment Plant



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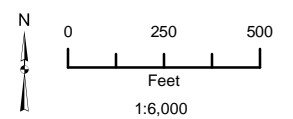


PRIORITY AREA 1 SPECIFIC PLAN

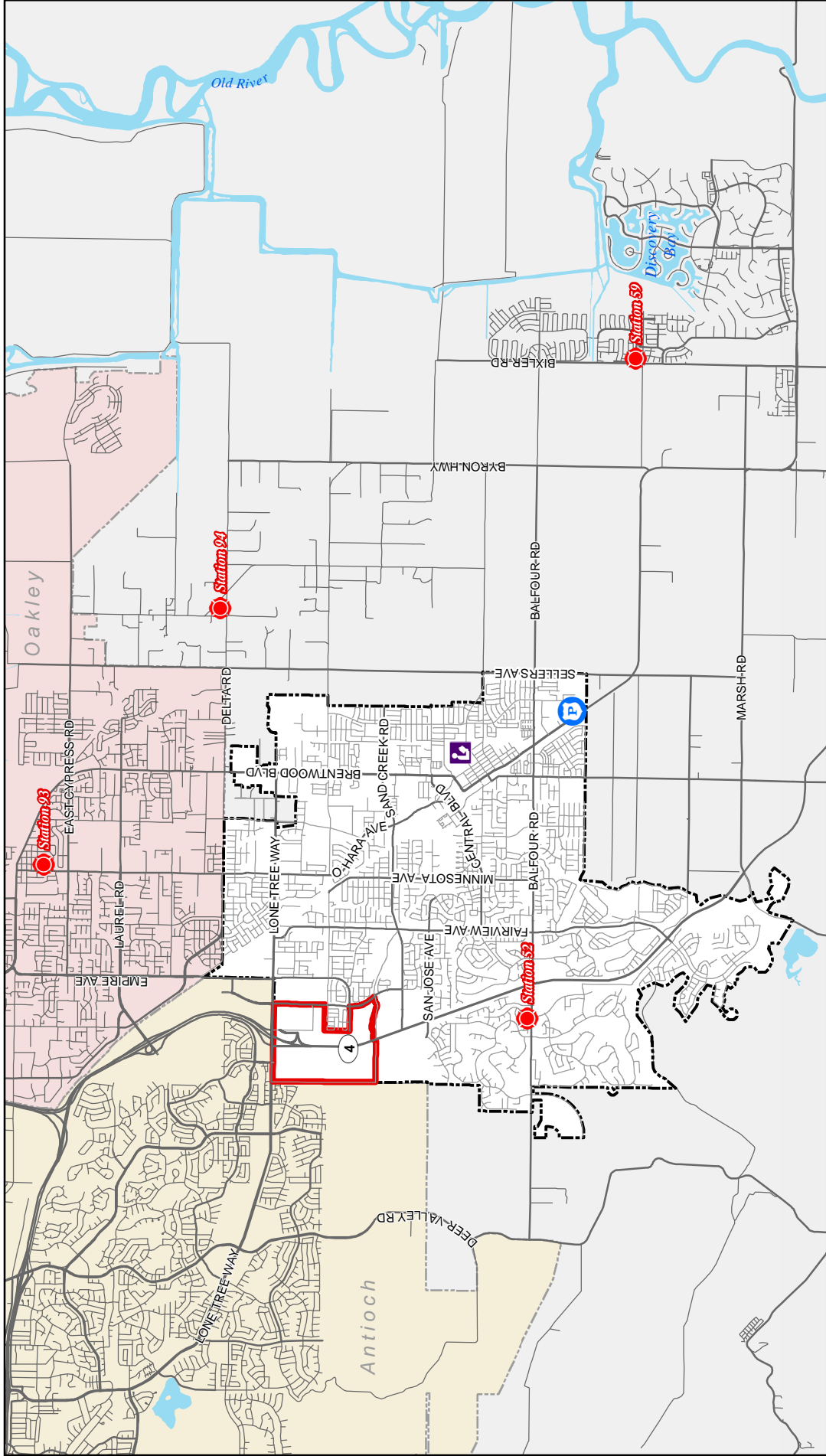
Figure 3.1-3. City of Brentwood Utilities

LEGEND

- | | |
|-----------------------|--------------------------|
| Brentwood Non-Potable | Brentwood Potable |
| ECCID | Antioch Potable |
| ECCID Unverified | CCWD |
| Fiber Optic | CCWD-Unverified |
| Brentwood Storm Drain | Brentwood Sewer |
| Antioch Storm Drain | Antioch Sewer |
| PG&E Gas Pipeline | Priority Area 1 Boundary |



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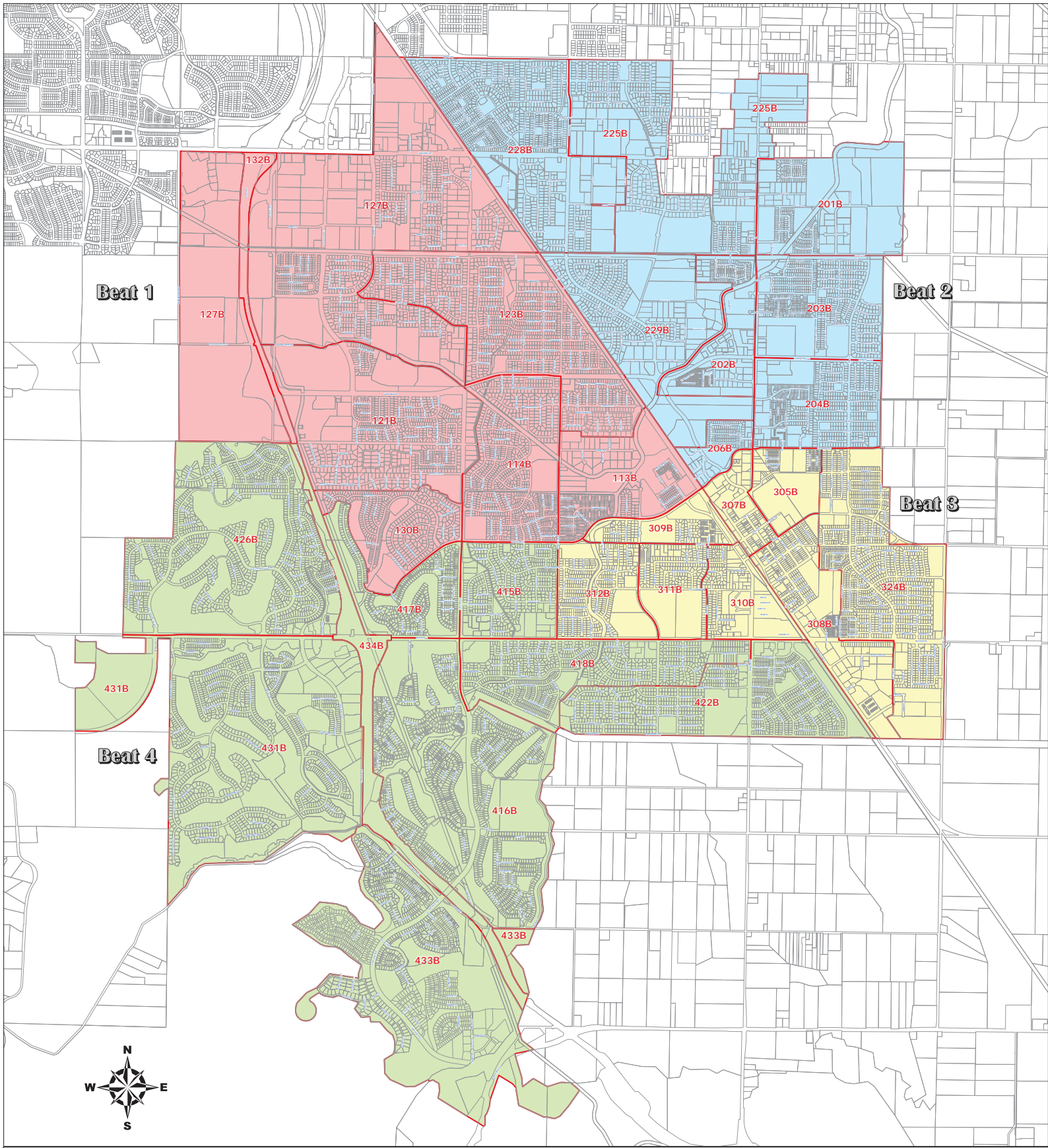
PRIORITY AREA 1 SPECIFIC PLAN
Figure 3.2-1: Community Services Map

- Legend**
- PA-1 Boundary
 - City of Brentwood
 - Community Service Facility
 - Fire Station
 - Brentwood Community Center Library
 - Police Department



Sources: City of Brentwood - OpenStreets. Map date: April 25, 2016.

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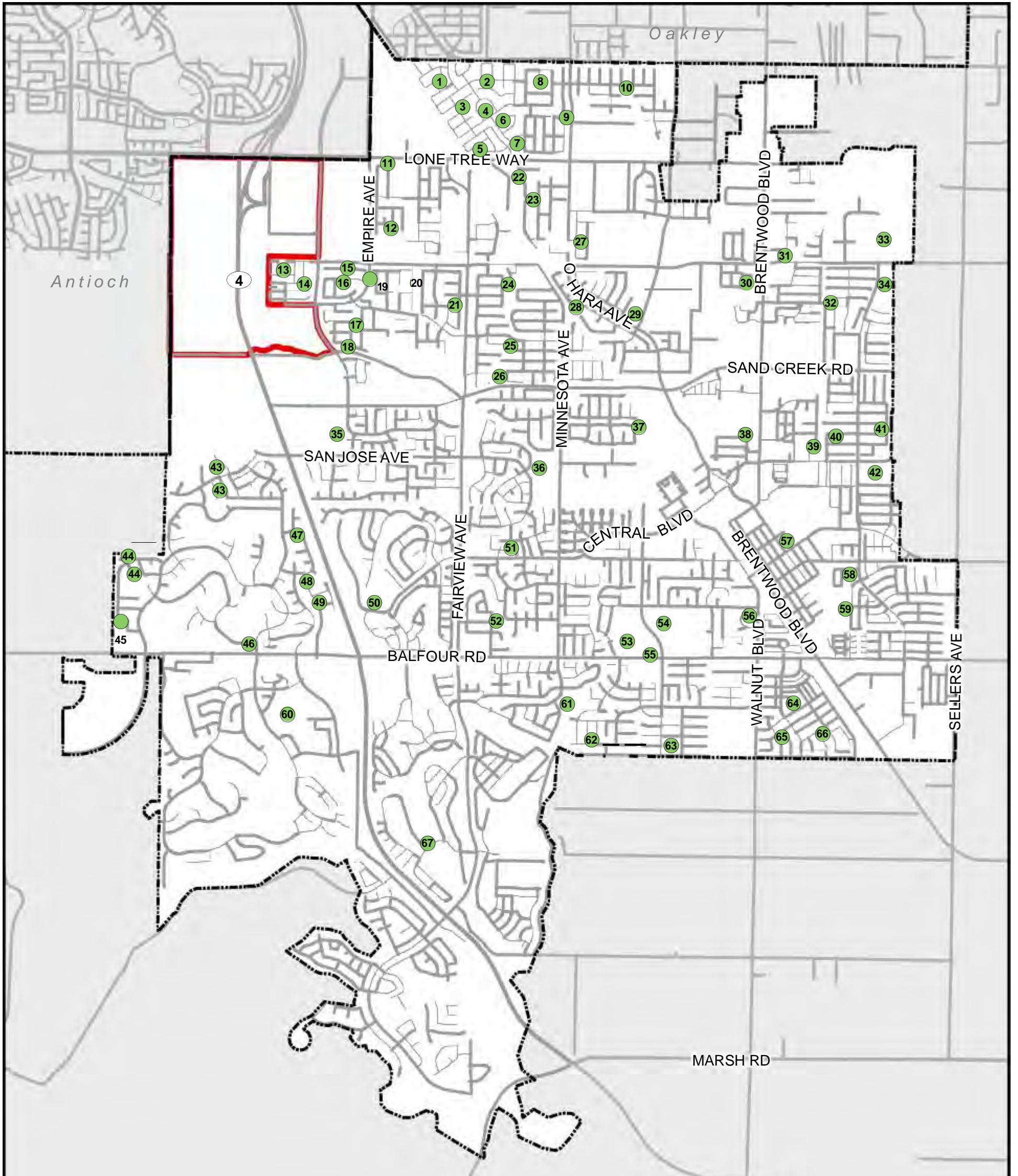
- Beat 1
- Beat 4
- Beat 3
- Beat 2

PRIORITY AREA 1 SPECIFIC PLAN

Figure 3.2-2: Brentwood Police Department Beat and Reporting Districts

Data source: City of Brentwood. Map date: February 11, 2016.

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Map ID	Park Name
1	Celeste Park
2	Anastasia Park
3	Rainbow s End Park
4	Rose Garden Park
5	Gemini Park
6	Kaleidoscope Park
7	Medallion Park
8	Granville Green Park
9	Steeplechase Park

Map ID	Park Name
10	Arbor View Park
11	Amber Park
12	Topaz Park
13	Appaloosa Park
14	Palomino Park
15	Apricot Park
16	Peach Park
17	Cherry Park
18	Almond Park

Map ID	Park Name
19	Fruit wood Park
20	Yukot Park
21	La Pergola Pocket Park
22	Gann Street Pocket Park
23	Wheatfield Park
24	Miw ok Park
25	Miw ok Trail
26	King Park
27	Seedling Park

Map ID	Park Name
28	Caboose Park
29	Blue Goose Park
30	Marsh Creek Vista Park
31	Homecoming Park
32	Daytona Park
33	Sunset Park Athletic Complex
34	Dakota Park
35	Loma Vista Park
36	Summerwood Park

Map ID	Park Name
37	Sungold Park
38	Curtis Park
39	Windsor Way Park
40	Egret Park
41	Mallard Park
42	Heron Park
43	Black Gold Park
44	Rolling Hills Park
45	Balfour-Guthrie Park

Map ID	Park Name
46	Lake Park
47	Berkshire Park
48	Cortona Park
49	Carrara Pocket Park
50	Apple Hill Park
51	Stonehaven Park
52	Sage Glen Park
53	Veterans Park
54	Brentwood Skate Park




Map ID	Park Name
55	Brentwood Family Aquatic Park
56	McClarren Park
57	City Park
58	Almanor Park
59	Garin Park
60	Oak Meadow Park
61	Creekside Park
62	Creekside Trail Head Park
63	Orchard Park

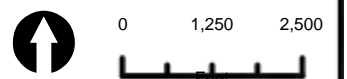
Map ID	Park Name
64	Walnut Park
65	Spirit Park
66	Glory Park
67	Summerset Commons

PRIORITY AREA 1 SPECIFIC PLAN

Figure 3.3-1: Park and Recreation Map

Legend

-  PA-1 Boundary
-  City Limits
-  Park Location



Data sources: City of Brentwood GIS. Map date: April 25, 2016.

4.0 HAZARDS, SAFETY, AND NOISE

Issues and topics related to health, safety, and noise within the Specific Plan Area are addressed in this chapter. Some of these hazards may be naturally induced, such as wildfire hazards. Other health and safety hazards may be the result of natural hazards, which are exacerbated by human activity, such as development in areas prone to flooding. Additional hazards are entirely human-made, including airport crash hazards and exposure to hazardous materials. A description of the existing noise environment with the Plan Area, including noise monitoring survey results, are included in this chapter.

This chapter is divided into the following sections:

- 4.1 Hazards and Hazardous Materials
 - 4.1.1 Hazardous Materials and Waste
 - 4.1.2 Fire Hazards
 - 4.1.3 Flooding
 - 4.1.4 Air Traffic
- 4.2 Noise

4.1 HAZARDS AND HAZARDOUS MATERIALS

This section addresses the existing hazards and hazardous materials within the City of Brentwood and the Plan Area, including hazardous materials and waste, fire hazards, flooding, and air traffic.

4.1.1 HAZARDOUS MATERIALS AND WASTE

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials.

Hazardous waste is the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

REGULATORY FRAMEWORK

FEDERAL

Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)

This act, commonly associated with the term “Superfund,” established:

- Regulations concerning closed and abandoned hazardous waste sites
- Liability of parties responsible for any releases of hazardous waste at these sites
- Funding for cleanup when responsible parties cannot be identified

Resource Conservation and Recovery Act (RCRA)

This act established EPA's "cradle to grave" control (generation, transportation, treatment, storage, and disposal) over hazardous materials and wastes. In California, the Department of Toxic Substances Control (DTSC) has RCRA authorization.

Clean Air Act

According to the Clean Air Act, the EPA has established National Emissions Standards for Hazardous Air Pollutants. Exceeding the emissions standard for a given air pollutant may cause an increase in illnesses and/or fatalities.

Clean Water Act

The CWA, which amended the WPCA of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the U.S. and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the U.S. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of Federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

STATE

California Health & Safety Code

Division 20 of the Health and Safety Code establishes Department of Toxic Substances Control (DTSC) authority and sets forth hazardous waste and underground storage tank regulations. In addition, the division creates a State superfund framework that mirrors the Federal program.

Division 26 of the Health and Safety Code establishes California Air Resources Board (CARB) authority. The division designates CARB as the air pollution control agency per Federal regulations and charges the Board with meeting Clean Air Act requirements.

Food and Agriculture Code

Division 6 of the California Food and Agricultural Code (FAC) establishes pesticide application regulations. The division establishes training standards for pilots conducting aerial applications as well as permitting and certification requirements.

Water Code

Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Water Quality Control Act, created the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB). In addition, water quality responsibilities are established for the SWRCB and RWQCBs.

California Code of Regulations

Title 3 of the CCR pertains to the application of pesticides and related chemicals. Parties applying regulated substances must continuously evaluate application equipment, the weather, the treated lands and all surrounding properties. Title 3 prohibits any application that would:

- Contaminate persons not involved in the application
- Damage non-target crops or animals or any other public or private property
- Contaminate public or private property or create health hazards on said property

Title 8 of the CCR establishes California Occupational Safety and Health Administration (Cal OSHA) requirements related to public and worker protection. Topics addressed in Title 8 include materials exposure limits, equipment requirements, protective clothing, hazardous materials, and accident prevention. Construction safety and exposure standards for lead and asbestos are set forth in Title 8.

Title 14 of the CCR establishes minimum standards for solid waste handling and disposal.

Title 17 of the CCR establishes regulations relating to the use and disturbance of materials containing naturally occurring asbestos.

Title 22 of the CCR sets forth definitions of hazardous waste and special waste. The section also identifies hazardous waste criteria and establishes regulations pertaining to the storage, transport, and disposal of hazardous waste.

Title 26 of the CCR is a medley of State regulations pertaining to hazardous materials and waste that are presented in other regulatory sections. Title 26 mandates specific management criteria related to hazardous materials identification, packaging, and disposal. In addition, Title 26 establishes requirements for hazardous materials transport, containment, treatment, and disposal. Finally, staff training standards are set forth in Title 26.

Title 27 of the CCR sets forth a variety of regulations relating to the construction, operation and maintenance of the State's landfills. The title establishes a landfill classification system and categories of waste. Each class of landfill is constructed to contain specific types of waste (household, inert, special, and hazardous).

LOCAL

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following policies related to safety concerning hazardous materials and waste:

Safety Element

GOAL SA-4: Protect citizens from dangers related to the movement, storage, and manufacture of hazardous materials.

POLICY SA 4-2: Require hazardous waste generated within the city limits of Brentwood to be disposed of in a safe manner, consistent with all applicable local, State, and Federal laws.

POLICY SA 4-3: Hazardous materials shall be stored in a safe manner, consistent with all applicable local, State, and Federal laws.

POLICY SA 4-4: Coordinate with the East Contra Costa Fire Protection District to ensure that businesses in Brentwood which handle hazardous materials prepare and file a Hazardous Materials Business Plan (HMBP). The HMBP shall consist of general business information, basic information on the location, type, quantity, and health risks of hazardous materials, and emergency response and training plans.

ACTION SA 4a: Provide educational opportunities for generators of small quantity, household, and agricultural waste products regarding their responsibilities for source reduction and proper and safe hazardous waste management and disposal.

ACTION SA 4b: Provide a convenient program for the local disposal of household hazardous wastes at Brentwood's Solid Waste Transfer Station on a routine basis. The availability of the program should be widely publicized throughout the community.

ACTION SA 4c: Work cooperatively with the East Contra Costa Fire Protection District to train local police and fire personnel in the specialized handling and cleanup procedures that are required for radioactive, toxic, and hazardous substance spills.

ACTION SA 4d: Prepare and maintain an inventory of environmentally contaminated sites to educate future property owners about contamination from previous uses. The City shall work directly with property owners in the cleanup of these sites, particularly in areas with redevelopment potential.

ENVIRONMENTAL SETTING

Envirostor Data Management System

The DTSC maintains the *Envirostor Data Management System*, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. This site cleanup information includes: Federal Superfund Sites (NPL), State Response Sites, Voluntary Cleanup Sites, School Cleanup Sites, Corrective Action Sites, Tiered Permit Sites, and Evaluation / Investigation Sites. The hazardous waste facilities include: Permitted–Operating, Post-Closure Permitted, and Historical Non-Operating.

There are no sites listed in the Envirostor database within the Specific Plan Area. The nearest site listed on the Envirostor database is located at 2200 Shady Willow Lane/2301 & 2251 Empire Avenue, approximately 0.03 miles east of the Specific Plan Area. There are six sites listed in the Envirostor database within one mile of the Specific Plan Area, only one of which has an active status. Three sites are listed as school investigation sites, one is listed as a school cleanup site, and two are listed as voluntary cleanup sites. La Paloma, a school investigation site with a no further action determination, has been approved by the DTSC after the completion of a cleanup program by a non-DTSC affiliated local developer. Loma Vista Elementary Classroom Addition and Meadow Creek Elementary are both school investigation sites with no action required determinations. The Empire Elementary school cleanup site was certified by the DTSC in June 2003. One voluntary cleanup site, the Miles-Fenell Property, was found to require no further action as of August 2014. One active property, the Skipolini Property voluntary cleanup site, is located approximately 0.97 miles east of the Specific Plan Area. Table 4.1-1 includes a complete list of the sites listed in the Envirostor database within one mile of the Specific Plan Area.

TABLE 4.1-1: ENVIROSTOR SITE CLEANUP AND HAZARDOUS FACILITIES WITHIN 1 MILE OF SPECIFIC PLAN AREA

<i>NAME</i>	<i>STATUS DATE</i>	<i>LOCATION</i>
<i>VOLUNTARY CLEANUP</i>		
Miles-Fenell Property	8/12/2014	2200 Shady Willow Lane, 2301 & 2251 Empire Avenue, Brentwood
Skipolini Property	1/1/2016	7281 Lone Tree Way, Brentwood
<i>SCHOOL INVESTIGATION</i>		
La Paloma	9/09/2004	6651 Lone Tree Way, Brentwood
Meadow Creek Elementary	4/7/2000	Vista Grande Drive/Country Hills Drive, Antioch
Loma Vista Elementary Classroom Addition	5/31/2001	2110 San Jose Avenue, Brentwood
<i>SCHOOL CLEANUP</i>		
Empire Elementary School	6/09/2003	Empire Avenue/Amber Lane, Brentwood

SOURCE: CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, ENVIROSTOR DATABASE, 2016.

Cortese List

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. California Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. There are no hazardous materials release sites located in the vicinity of the Project Area.

GeoTracker

GeoTracker is the California Water Resource Control Board's data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense, Site Cleanup Program) as well as permitted facilities such as operating USTs and land disposal sites.

LEAKING UNDERGROUND STORAGE TANKS (LUST)

There are no locations within 1.5 miles of the project area that are listed in the GeoTracker database for Leaking Underground Storage Tanks (LUST).

PERMITTED UNDERGROUND STORAGE TANK (UST)

There are no locations within 1.5 miles of the Specific Plan Area that have Underground Storage Tanks (UST) permitted through the California Water Resources Control Board.

WATER BOARD PROGRAM CLEANUP SITES

There are two sites listed in the GeoTracker database within one mile of the Specific Plan Area, both of which are listed as Cleanup Program Sites. Both of the sites have undergone cleanup and are closed cases. Table 4.1-2 includes a complete list of the sites listed in the GeoTracker database within one mile of the Specific Plan Area.

4.0 HAZARDS, SAFETY, AND NOISE

TABLE 4.1-2: GEOTRACKER HAZARDOUS MATERIAL RELEASE SITES WITHIN 1 MILE OF SPECIFIC PLAN AREA

NAME	LOCATION
<i>CLEANUP PROGRAM SITES (COMPLETED – CASE CLOSED)</i>	
Chevron, Minnesota Ave, Brentwood	Cambrian Place, Brentwood
Shell Yard	3052 Heidorn Ranch Road, Antioch

SOURCE: STATE WATER RESOURCES CONTROL BOARD, GEOTRACKER DATABASE, 2016.

WATER BOARD CEASE AND DESIST ORDERS

The California Water Resources Control Board issued a Cease and Desist Order to the City of Brentwood (CDO R5-2012-0114) January 25, 2008 as operator and discharger of the Brentwood Wastewater Treatment Plant. The Order provides time schedules for the City of Brentwood to develop, submit, and implement methods of compliance, including utilizing pollution prevention activities or construction of necessary treatment facilities to meet new effluent limitations.

The WWTP’s design average dry weather flow capacity is 5 million gallons per day (mgd) consisting of a headworks (screening and grit removal), two extended aeration activated sludge basins, two denitrification basins, two secondary clarifiers, two banks of two single media filters (a total of four filters), a chlorine contact chamber, dechlorination, and a cascade aeration system. The WWTP discharges tertiary treated effluent to Marsh Creek, a water of the United States, within the Sacramento-San Joaquin Delta. Periodically, the City of Brentwood uses on-site percolation ponds for land disposal of secondary treated effluent.

Solid Waste Information System (SWIS)

FACILITY/SITE LISTING

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the California Integrated Waste Management Board (CIWMB). The SWIS data identifies active, planned and closed sites. The City of Brentwood has one active solid waste facility listed in the database. The property is the Brentwood Solid Waste Transfer Station located at 2301 Elkins Way. The facility is owned by the City of Brentwood, is administered by the Public Works Department, and is inspected numerous times each year. The most recent inspections of this facility (as of July 2016) by the Local Enforcement Agency (Contra Costa County Health Services Department Environmental Health Division) show no violations or areas of concern. The site details are listed in Table 4.1-3 below.

TABLE 4.1-3: CIWMB FACILITIES/SITES

NUMBER	NAME	ACTIVITY	REGULATORY	STATUS
07-AA-0068	Brentwood Solid Waste Transfer Station	Large Volume Transfer/Proc Facility	Permitted	Active

SOURCE: CALRECYCLE, SWIS FACILITY/SITE SEARCH, 2016.

Electricity and Natural Gas

Infrastructure to deliver electricity and natural gas throughout Brentwood is currently in place. PG&E generally can provide these services to newer development on request. Within the Specific Plan Area, PG&E gas utilities are located along the western portion of the planning area, and natural gas, electricity, and fiber optic cables are located throughout the developed portions of the Plan Area. Specifically, a natural gas pipeline is located along the western boundary of the Specific Plan Area along Heidorn Ranch Road.

4.1.2 FIRE HAZARDS

This section addresses the hazards associated with wildfires in the City of Brentwood and Specific Plan Area.

IDENTIFYING FIRE HAZARDS

Fuel Rank

Fuel rank is a ranking system developed by CalFire that incorporates four wildfire factors: fuel model, slope, ladder index, and crown index.

The USFS has developed a series of fuel models, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior. In addition to fuel characteristics, slope is an important contributor to fire hazard levels. A surface ranking system has been developed by CalFire, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10%, 11-25%, 26-40%, 41-55%, 56-75% and >75%. The combined fuel model and slope data are organized into three categories, referred to as surface rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.

The ladder index is a reflection of the distance from the ground to the lowest leafy vegetation for tree and plant species. The crown index is a reflection of the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index and crown index for a given area are combined in order to establish a fuel rank of medium, high or very high. Fuel rank is used by CalFire to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

The City of Brentwood is primarily devoid of CalFire fuel ranks. The exceptions are areas within the undeveloped Sphere of Influence in the southwestern portion of the City's Planning Area. These areas contain vegetation that possess characteristics warranting "moderate" fuel ranks. These areas possess combustible material in sufficient quantities combined with topographic characteristics that pose a wildfire risk. In contrast, the majority of land in the City limits, including the Specific Plan Area, lacks the topographic characteristics that could significantly affect fire behavior. CalFire data for the foothill and mountain areas to the west of the City include a preponderance of "moderate" and "high" fuel ranks.

Fire Threat

The fuel rank data are used by CalFire to delineate fire threat based on a system of ordinal ranking. Thus, the Fire Threat model creates discrete regions, which reflect fire probability and predicted fire behavior. The four classes of fire threat range from moderate to extreme. (California Department of Forestry and Fire Protection, 2010).

FIRE HAZARD SEVERITY ZONES

The state has charged CalFire with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CalFire must recommend Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas. The FHSZ maps are used by the state Fire Marshall as a basis for the adoption of applicable building code standards.

Local Responsibility Areas

Local Responsibility Areas (LRA) are concentrated in the incorporated areas of Contra Costa County. Brentwood is an LRA that is served by the East Contra Costa Fire Protection District (ECCFPD). The ECCFPD provides fire protection services to Brentwood, Discovery Bay, Oakley, and Knightsen. The City of Brentwood is not categorized as a "Very High" FHSZ by CalFire.

State Responsibility Areas

State Responsibility Areas within the City's Planning Area are found to the southwest in the hilly terrain of the Diablo Foothills. Specifically, this includes the areas that are outside the City limits, but within the Sphere of Influence. The hilly terrain in the southwest portion of the Planning Area is categorized as a "Moderate" FHSZ. This "Moderate" FHSZ extends to the west where it transitions to "High" FHSZ in the steeper areas of the Diablo Foothills. The closest "Very High" FHSZ to the Specific Plan Area is located approximately 0.55 miles to the south.

Federal Responsibility Areas

There are no Federal Responsibility Areas within the vicinity of the City.

4.1.3 FLOODING

This section addresses the hazards associated with flooding in the City of Brentwood and Specific Plan Area.

REGULATORY SETTING

FEDERAL

Federal Emergency Management Agency (FEMA)

FEMA operates the National Flood Insurance Program (NFIP). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the California Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

Rivers and Harbors Appropriation Act of 1899

One of the country's first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

Water Pollution Control Act of 1972

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States

Flood Control Act

The Flood Control Act (1917) established survey and cost estimate requirements for flood hazards in the Sacramento Valley. All levees and structures constructed per the Act were to be maintained locally but controlled federally. All rights of way necessary for the construction of flood control infrastructure were to be provided to the Federal government at no cost.

Federal involvement in the construction of flood control infrastructure, primarily dams and levees, became more pronounced upon passage of the Flood Control Act of 1936.

National Flood Insurance Program (NFIP)

Per the National Flood Insurance Act of 1968, the NFIP has three fundamental purposes: *Better indemnify individuals for flood losses through insurance; Reduce future flood damages through State and community floodplain management regulations; and Reduce Federal expenditures for disaster assistance and flood control.*

While the Act provided for subsidized flood insurance for existing structures, the provision of flood insurance by FEMA became contingent on the adoption of floodplain regulations at the local level.

Flood Disaster Protection Act (FDPA)

The FDPA of 1973 was a response to the shortcomings of the NFIP, which were experienced during the flood season of 1972. The FDPA prohibited Federal assistance, including acquisition, construction, and financial assistance, within delineated floodplains in non-participating NFIP communities. Furthermore, all Federal agencies and/or federally insured and federally regulated lenders must require flood insurance for all acquisitions or developments in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP.

Improvements, construction, and developments within SFHAs are generally subject to the following standards:

- All new construction and substantial improvements of residential buildings must have the lowest floor (including basement) elevated to or above the base flood elevation (BFE).
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE.
- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns.
- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

STATE

Assembly Bill 162

This bill requires a general plan's land use element to identify and annually review those areas covered by the general plan that are subject to flooding as identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources (DWR). The bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a State-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

Assembly Bill 70

This bill provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by a flood to the extent that it has increased the State's exposure to liability for property damage by unreasonably approving, as defined, new development in a previously undeveloped area, as defined, that is protected by a State flood control project, unless the city or county meets specified requirements.

CA Government Code

The Senate and Assembly bills identified above have resulted in various changes and additions to the California Government Code. Key sections related to the above referenced bills are identified below.

Section 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

Section 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

Section 8589.4

California Government Code §8589.4, commonly referred to as the Potential Flooding-Dam Inundation Act, requires owners of dams to prepare maps showing potential inundation areas in the event of dam failure. A dam failure inundation zone is different from a flood hazard zone under the National Flood Insurance Program (NFIP). NFIP flood zones are areas along streams or coasts where storm flooding is possible from a "100-year flood." In contrast, a dam failure inundation zone is the area downstream from a dam that could be flooded in the event of dam failure due to an earthquake or other catastrophe. Dam failure inundation maps are reviewed and approved by the California Office of Emergency Services (OES). Sellers of real estate within inundation zones are required to disclose this information to prospective buyers.

LOCAL

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following policies related to flooding:

Safety Element

GOAL SA 2 – Reduce risks to human life, property, and public services associated with flooding.

POLICY SA 2-1 - Support and participate in planning efforts undertaken at the regional, State, and Federal levels to improve flood management facilities throughout Contra Costa County.

POLICY SA 2-2 - Require all development projects to demonstrate how storm water runoff will be detained or retained on-site, treated, and/or conveyed to the nearest drainage facility as part of the

development review process. Project applicants shall demonstrate that project implementation would not result in increases in the peak flow runoff to adjacent lands or drainage facilities that would exceed the design capacity of the drainage facility or result in an increased potential for off-site flooding.

POLICY SA 2-3 - Ensure that construction activities will not result in adverse impacts to existing flood control and drainage structures.

POLICY SA 2-4 - For properties located within a flood hazard zone, as identified on the most recent FEMA floodplain map or identified by the California Department of Water Resources, the City shall not enter into a development agreement, approve any discretionary entitlement, tentative parcel map, parcel map, final map, or any ministerial permit that would result in the construction of a new residence unless flood protection findings consistent with the requirements of California Government Code Sections 65865.5, 65962, 66474.5 can be made and documented.

POLICY SA 2-5 - All new development within an identified floodplain shall be built according to Federal Emergency Management Agency standards.

POLICY SA 2-6 - Unless otherwise mitigated, require new structures to be located outside of the 100-year floodplain to the greatest extent feasible.

POLICY SA 2-7 - Monitor ongoing efforts by Federal and State agencies to update flood hazard maps within Brentwood and Contra Costa County.

POLICY SA 2-8 - Encourage and accommodate multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of Brentwood's streams, creeks, and wetland/riparian areas. Where appropriate and feasible, the City shall also encourage the use of flood and/or storm water retention facilities for use as groundwater recharge facilities.

POLICY SA 2-9 - Encourage flood control measures that respect natural drainage features, vegetation, and natural waterways, while still providing for adequate flood control and protection.

POLICY SA 2-10 - Continue efforts to reduce flooding potential, by working with the Contra Costa County Flood Control & Water Conservation District in upgrading and expanding the storm drainage system.

POLICY SA 2-11 - Ensure that new development or governmental action does not compound the potential for flooding.

POLICY SA 2-12 - Ensure that adequate drainage and erosion control measures are provided during construction of all new development.

Action SA 2a - Develop a Flooding and Drainage Master Plan that addresses the following, at a minimum:

1. Storm water and drainage improvements for all areas of the city that are needed to accommodate existing and planned growth;
2. Standards for on and off-site storm water and flooding improvements to ensure no adverse impacts to adjacent or nearby properties;

3. Standard measures to be used by new development to address localized flooding impacts;
4. Identification of areas for stream channel or flood control conveyance system enlargement and/or stabilization;
5. Operation, maintenance, and funding of flood control and drainage facilities; and
6. Opportunities for multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the city's streams, creeks, and wetland/riparian areas.

Action SA 2b - During the annual preparation of the Capital Improvement Program (CIP), review the conditions of bridges, culverts, and other flood control and storm water conveyance infrastructure, and include necessary improvements within the CIP to ensure safety of persons in the city and adequate conveyance of flood waters.

Action SA 2c - Seek State and Federal funding for flood control and drainage infrastructure improvements.

Action SA 2d - Review the Brentwood Municipal Code, including Chapter 15.07 (Floodplain Management), and revise as necessary to ensure that development standards are consistent with the requirements of State law, including Government Code Section 65007. Development and building standards shall require the following:

1. New structures proposed for location within the 100-year floodplain shall be elevated one (1) foot or more above the 100-year flood elevation;
2. New construction in the 100-year floodplain shall be designed and constructed so that it does not contribute to cumulative flooding problems that could pose a hazard to surrounding property owners or the public;
3. Discourage extensive areas of impermeable surfaces within the 100-year floodplain and promote the use of permeable materials for surfaces such as driveways and parking lots; and
4. Ensure that new development within the 100-year floodplain includes all-weather access roads or other measures to ensure adequate access during a flood event.

EXISTING SETTING

The City of Brentwood is located in eastern Contra Costa County, California approximately 50 miles east of San Francisco and 50 miles southwest of Sacramento. Brentwood is situated in the western portion of the San Joaquin Valley, immediately east of the Diablo Range which forms the eastern boundary of the Coast Ranges.

The topography of Brentwood is characterized by the relatively flat terrain typical 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 Brentwood range from 25 feet above mean sea level (MSL) in the northeast portion of the city to 492 feet above MSL at the highest peak in the southwest portion of the city.

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 Brentwood. Marsh Creek is the largest of the waterways within Brentwood. Sand Creek, Deer Creek, and Dry Creek flow into Marsh Creek. 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 Brentwood, and extends north to its confluence with the San Joaquin River located in the city of Oakley.

Climate

The City of Brentwood and the Specific Plan Area have cool and humid winters and hot and dry summers. Average daily temperature ranges from 35 to 92 degrees Fahrenheit (°F), but the extreme low and high temperatures have been 18°F and 117°F, respectively. The rainy season begins in November and ends in March. Average monthly precipitation during the winter months is about two to three inches, but records show that the monthly winter precipitation has been as high as eight inches and as low as zero inches. Water demands during the winter are relatively low. Low humidity usually occurs in the summer months, from May to September. The combination of hot and dry weather during the summer results in high water demand during these periods. Landscape irrigation, including lawn irrigation in the summer, significantly contributes to higher summer water demand.

FEMA Flood Zones

FEMA mapping provides important guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The FEMA flood zone designations for the Specific Plan Area and surrounding areas is shown on Figure 5.6-1.

Areas that are subject to flooding are provided based on anticipated exposure to flood events:

- **1% Annual Chance Flood Hazard (100-yr Flood Zone):** Subject to 100-year flooding. Identified as an area that has a one percent chance of being flooded in any given year.
- **0.2% Annual Chance Flood Hazard (500-year Flood Zone):** Subject to 500-year flooding. Identified as an area that has a 0.2 percent chance of being flooded in a given year.

A small portion of the southern boundary of the Specific Plan Area is located within a 100-year flood zone (area that is adjacent to Sand Creek). This is typical – the City of Brentwood as a whole is subject to flooding problems along the natural creeks and drainages that traverse the city. Marsh Creek, Dry Creek, Deer Creek, and Sand Creek are the most prominent drainages in the city that are subject to flooding. Additionally, as shown in Figure 5.6-1, a 500-year flood zone is identified to the east of the Specific Plan Area, north of Sand Creek and west of Fairview Avenue.

Dam Inundation

Earthquakes centered close to a dam are typically the most likely cause of dam failure. Dam Inundation maps have been required in California since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. The City of Brentwood has four dams that are identified by the Division of Safety of Dams as Major Dams; the Los Vaqueros Dam, Marsh Creek Dam, Deer Creek Dam, and Dry Creek Dam. Each dam is briefly described below:

4.0 HAZARDS, SAFETY, AND NOISE

- The Los Vaqueros Dam, owned and operated by the Contra Costa Water District, is an earthen dam located on Kellogg Creek. This dam was built in 1997 and raised in 2012 to a height of 226 feet with a reservoir capacity of 160,000 acre-feet.
- The Marsh Creek Dam, owned and operated by the Contra Costa County Flood Control and Water Conservation District, is an earthen dam located on Marsh Creek. This dam was built in 1963 at a height of 59 feet with a reservoir capacity of 4,425 acre-feet.
- The Deer Creek Dam, owned and operated by the Contra Costa County Flood Control and Water Conservation District, is an earthen dam located on Deer Creek. This dam was built in 1963 at a height of 28 feet with a reservoir capacity of 233 acre-feet.
- The Dry Creek Dam, owned and operated by the Contra Costa County Flood Control and Water Conservation District, is an earthen dam located on Dry Creek. This dam was built in 1963 at a height of 30 feet with a reservoir capacity of 300 acre-feet.

These four dams do not have a history of dam failure; however, these dams are identified as having the potential to inundate habitable portions of the City of Brentwood (including the Specific Plan Area) in the unlikely event of dam failure. The dam owners/operators, Contra Costa Water District and Contra Costa County Flood Control and Water Conservation District, are responsible for the management, monitoring, and improvements to these dams to reduce the risk of dam failure and inundation.

4.1.4 AIR TRAFFIC

The State Division of Aeronautics has compiled extensive data regarding aircraft accidents around airports in California. This data is much more detailed and specific than data currently available from the FAA and the National Transportation Safety Board (NTSB). According to the California Airport Land Use Planning Handbook (2002), prepared by the State Division of Aeronautics, 18.2 percent of general aviation accidents occur during takeoff and initial climb and 44.2 percent of general aviation accidents occur during approach and landing. The State Division of Aeronautics has plotted accidents during these phases at airports across the country and has determined certain theoretical areas of high accident probability.

Approach and Landing Accidents

As nearly half of all general aviation accidents occur in the approach and landing phase of flight, considerable work has been done to determine the approximate probability of such accidents. Nearly 77 percent of accidents during this phase of flight occur during touchdown onto the runway or during the roll-out. These accidents typically consist of hard or long landings, ground loops (where the aircraft spins out on the ground), departures from the runway surface, etc. These types of accidents are rarely fatal and often do not involve other aircraft or structures. Commonly these accidents occur due to loss of control on the part of the pilot and, to some extent, weather conditions. (California Division of Aeronautics, 2002).

The remaining 23 percent of accidents during the approach and landing phase of flight occur as the aircraft is maneuvered towards the runway for landing, in a portion of the airspace around the airport commonly called the traffic pattern. Common causes of approach accidents include the pilot's misjudging of the rate of descent, poor visibility, unexpected downdrafts, or tall objects beneath the final approach course. Improper use of rudder on an aircraft during the last turn toward the runway can sometimes result in a stall (a cross-control stall) and resultant spin, causing the aircraft to strike the ground directly below the aircraft. The types of events that lead to approach accidents tend to place the

accident site fairly close to the extended runway centerline. The probability of accidents increases as the flight path nears the approach end of the runway. (California Division of Aeronautics, 2002).

According to aircraft accident plotting provided by the State Division of Aeronautics, most accidents that occur during the approach and landing phase of flight occur on the airport surface itself. The remainder of accidents that occur during this phase of flight are generally clustered along the extended centerline of the runway, where the aircraft is flying closest to the ground and with the lowest airspeed. (California Division of Aeronautics, 2002).

Takeoff and Departure Accidents

According to data collected by the State Division of Aeronautics, nearly 65 percent of all accidents during the takeoff and departure phase of flight occur during the initial climb phase, immediately after takeoff. This data is correlated by two physical constraints of general aviation aircraft:

- The takeoff and initial climb phase are times when the aircraft engine(s) is under maximum stress and is thus more susceptible to mechanical problems than at other phases of flight; and
- Average general aviation runways are not typically long enough to allow an aircraft that experiences a loss of power shortly after takeoff to land again and stop before the end of the runway.

While the majority of approach and landing accidents occur on or near to the centerline of the runway, accidents that occur during initial climb are more dispersed in their location as pilots are not attempting to get to any one specific point (such as a runway). Additionally, aircraft vary widely in payload, engine power, glide ratio, and several other factors that affect glide distance, handling characteristics after engine loss, and general response to engine failure. This further disperses the accident pattern. However, while the pattern is more dispersed than that seen for approach and landing accidents, the departure pattern is still generally localized in the direction of departure and within proximity of the centerline. This is partially due to the fact that pilots are trained to fly straight ahead and avoid turns when experiencing a loss of power or engine failure. Turning flight causes the aircraft to sink faster and flying straight allows for more time to attempt to fix the problem. (California Division of Aeronautics, 2002).

ENVIRONMENTAL SETTING

Facilities Located in the City of Brentwood

The City of Brentwood does not have any public or airport facilities located within the City limits, sphere of influence, of urban growth boundary.

Facilities Located Near the Specific Plan Area

The Specific Plan Area does not have any public or airport facilities located within the City limits, sphere of influence, of urban growth boundary.

The Byron Airport is located approximately eight miles southeast of the City of Brentwood Planning Area. This airport is a County-owned facility that occupies approximately 1,307 acres at an airport reference elevation of 76 feet above Mean Sea Level (MSL). The Airport has two nonintersecting runways each with a parallel taxiway and several connector taxiways. General aviation facilities are generally concentrated in a "V" formed by the two runways with approximately 10 acres of aircraft storage area, four acres of apron, 125,000 square feet of hangars, and 2,400 square feet of office space. The majority of these facilities were constructed when the airport was built in 1994. Approximately 814

acres of airport property to the south and west of the airfield are set aside as a wildlife preserve. None of the Planning Area lies within the land use compatibility zones for this airport (Contra Costa County Airport Land Use Commission, 2000).

Additionally, the Delta Air Park is located approximately 4.6 miles northeast of the Specific Plan Area.

The City of Brentwood, including the Specific Plan Area does not lie within the Runway Protection Zone, Inner/Outer Safety Zones, Inner Turning Zone, Sideline Safety Zone, or Traffic Pattern Zone for this airport. None of the Planning Area lies within the land use compatibility zones for this airport.

National Transportation Safety Board Aviation Accident Database

The National Transportation Safety Board Aviation Accident Database identifies a total of ten aircraft accidents with Brentwood identified as the nearest location from 1983 to 2013. (National Transportation Safety Board, 2011). The accidents involved a variety of aircraft, including airplanes and helicopters. None of the accidents occurred in the City's Planning Area (including the Specific Plan Area), and most were associated with private airstrips east of the Planning Area. Two of the accidents resulted in fatalities.

4.2 NOISE

This section provides a discussion of the regulatory setting and a general description of existing noise sources in the vicinity of the Specific Plan Area. The analysis in this section was prepared with assistance from j.c. brennan & associates, Inc (see Appendix C).

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response 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 weighted by a factor of 10 prior to averaging.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
L_(n)	The sound level exceeded as a described percentile over a measurement period. For instance, an hourly L ₅₀ 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.
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

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 from person to person.

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. CNEL is similar to L_{dn} , but includes a +3 dB penalty for evening noise. Table 4.2-1 lists several examples of the noise levels associated with common situations.

TABLE 4.2-1: TYPICAL NOISE LEVELS

<i>COMMON OUTDOOR ACTIVITIES</i>	<i>NOISE LEVEL (DBA)</i>	<i>COMMON INDOOR ACTIVITIES</i>
	--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. NOVEMBER 2009.

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. 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.

REGULATORY FRAMEWORK

FEDERAL

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for Federally funded roadway projects or projects that require Federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

Environmental Protection Agency (EPA)

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an L_{eq} of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an L_{eq} of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA L_{dn} as the basic goal for residential environments. However, other Federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA L_{dn} , have generally agreed on the 65 dBA L_{dn} level as being appropriate for residential uses. At 65 dBA L_{dn} activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The U.S. Department of Housing and Urban Development (HUD) was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Act (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA L_{dn} or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA L_{dn} but not exceeding 75 dBA L_{dn} - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA L_{dn} area and 10 dBA of attenuation in a 70 to 75 dBA L_{dn} area.

- Exceeding 75 dBA L_{dn} - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a goal of 45 dBA L_{dn} is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA L_{dn} or less, the interior level will be 45 dBA L_{dn} or less. Thus, structural attenuation is assumed at 20 dBA. However, HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The Federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

STATE

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 1998b). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

Governor's Office of Planning and Research (OPR)

OPR has developed guidelines for the preparation of general plans (Office of Planning and Research, 1998). The guidelines include land use compatibility guidelines for noise exposure.

LOCAL

City of Brentwood General Plan

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.

Noise Element

GOAL N-1: Preserve a pleasant noise environment and enhance the quality of existing and future land uses by minimizing exposure to harmful and excessive noise

POLICY N 1-1: Ensure the noise compatibility of existing and future development when making land use planning decisions.

POLICY N 1-2: Require development and infrastructure projects to be consistent with the Land Use Compatibility for Community Noise Environments standards indicated in Table N-1 [Table 4.2-2] to ensure acceptable noise levels for existing and future development.

POLICY N 1-3: Require new development to mitigate excessive noise through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials such as rubberized asphalt.

POLICY N 1-4: Require mixed-use projects to minimize noise exposure for indoor areas of nearby residential areas through the use of noise attenuating building materials, engineering techniques, and site design practices. Site design practices may include locating mechanical equipment, loading bays, parking lots, driveways, and trash enclosures away from residential uses, and providing noise-attenuating screening features on-site.

POLICY N 1-5: Periodically review and update, as necessary, Chapter 9.32 (Noise Regulations) of the Brentwood Municipal Code in order to address issues such as excessive noise from commercial, industrial, and other noise generating land uses, as well as vehicle noise, to the extent allowed by State law.

POLICY N 1-6: Require acoustical studies for new developments and transportation improvements that affect noise-sensitive uses such as schools, hospitals, libraries, group care facilities, convalescent homes, and residential areas.

POLICY N 1-7: For projects that are required by the California Environmental Quality Act (CEQA) to analyze noise impacts, the following criteria shall be used to determine the significance of those impacts:

Stationary and Non-Transportation Noise Sources

- A significant impact will occur if the project results in an exceedance of the noise level standards contained in this element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater.

Transportation Noise Sources

- Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in roadway noise levels will be considered significant; and
- Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB L_{dn} increase in roadway noise levels will be considered significant.

POLICY N 1-8: Support noise-compatible land uses along existing and future roadways, including County, State, and Federal routes.

POLICY N 1-9: Local truck traffic, including loading and unloading, shall be limited to specific routes, times, and speeds appropriate to each zoning district.

POLICY N 1-10: Work with Caltrans to ensure that adequate noise studies are prepared and alternative noise mitigation measures are considered in State transportation projects.

POLICY N 1-11: Ensure that existing development is protected, to the greatest extent feasible, from noise impacts due to construction on adjacent or nearby properties.

POLICY N 1-12: Work cooperatively with the Contra Costa County Airport Land Use Commission to minimize noise impacts from airspace activities in Brentwood, such as airplane and helicopter flights.

POLICY N 1-13: Control non-transportation related noise from site specific noise sources to the standards shown in Table N-2 [Table 4.2-3].

POLICY N 1-14: Ensure that new development does not result in indoor noise levels exceeding 45 dBA Ldn for residential uses.

POLICY N 1-15: Require construction activities to comply with standard best practices (see Action N 1e).

POLICY N 1-16: Temporary special events including, but not limited to, festivals, concerts, carnivals, rodeos, and other similar activities may be allowed to exceed the noise standards established in this General Plan and the standards established by Chapter 9.32 of the Brentwood Municipal Code through issuance of a temporary use permit (see section 9.32.080 of the Brentwood Municipal Code).

ACTION N 1a: Update Chapter 9.32 and Title 17 of the Brentwood Municipal Code to ensure that the noise standards are consistent with this element, including Tables N-1 and N-2 [Tables 4.2-2 and 4.2-3], and to require new residential, mixed-use with a residential component, and other noise-sensitive development to be designed to minimize noise exposure to noise sensitive uses through incorporation of site planning and architectural techniques.

ACTION N 1b: Review new development projects for compliance with the noise requirements established in this element, including the standards established in Tables N-1 and N-2 [Tables 4.2-2 and 4.2-3]. Where necessary, require mitigation measures to achieve the noise standards.

ACTION N 1c: Require acoustical studies for all new discretionary projects, including those related to development and transportation, which have the potential to generate noise impacts which exceed the standards identified in this element. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with this element and relevant noise standards in the Brentwood Municipal Code.

ACTION N 1d: Coordinate with Caltrans, the cities of Antioch and Oakley, and Contra Costa County, when necessary, to ensure that these agencies obtain City concurrence prior to initiating any noise mitigation or other project affecting Brentwood.

ACTION N 1e: During the environmental review process, determine if proposed construction will constitute a significant impact on nearby residents and, if necessary, require mitigation measures in addition to the standard best practice controls. Suggested best practices for control of construction noise include:

1. Construction period shall be less than 12 months.
2. Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited to between the hours of 7:00 am and 6:00 pm on weekdays, and between 8:00 am and 5:00 pm on Saturdays. No construction shall occur on Sundays or City holidays.

3. All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
4. The construction contractor shall utilize “quiet” models of air compressors and other stationary noise sources where technology exists.
5. At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.
6. Unnecessary idling of internal combustion engines shall be prohibited.
7. Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction activities, to the extent feasible.
8. The required construction-related noise mitigation plan shall also specify that haul truck deliveries are subject to the same hours specified for construction equipment.
9. Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.
10. The construction contractor shall designate a “noise disturbance coordinator” who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall be responsible for determining the cause of the noise complaint (e.g., starting too early, poor muffler, etc.) and instituting reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

GOAL N-2: Protect the city’s economic base by preventing incompatible land uses from encroaching upon existing or planned noise-producing agriculture, industries, farmland, airports, and other sources

POLICY N 2-1: Recognizing that existing and future traffic noise along the State Route 4 corridor is an area of potential land use conflict for existing and future development, reasonable use of this land will be allowed with an exterior noise exposure level not exceeding 65 dB Ldn. New development that includes noise-sensitive uses (i.e., residential) along the State Route 4 corridor should incorporate appropriate noise attenuation measures in order to maintain interior noise levels of 45 dB Ldn or less. Application of this noise standard is intended to provide for reasonable exterior noise levels while discouraging the use of excessively high and/or unattractive sound walls.

POLICY N 2-2: Recognizing that agricultural activities are important to Brentwood’s economic base and that agricultural operations are characterized by increased noise levels from the use of tractors, heavy equipment, crop dusting, agricultural products processing, and other supporting equipment and activities, new noise sensitive land uses that interface with agricultural lands must acknowledge and accept these increased noise levels as part of Brentwood’s rural heritage and lifestyle.

ACTION N 2a: As a condition of project approval, require new development that introduces sensitive noise receptors near agricultural lands or operations to acknowledge and comply with Chapter 8.01 (Right to Farm) of the Brentwood Municipal Code.

Existing City of Brentwood Noise Thresholds

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 General Plan includes an updated and revised set of noise impact criteria, as shown in Tables 4.2-2 and 4.2-3.

TABLE 4.2-2: LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENT

LAND USE CATEGORY	EXTERIOR NOISE EXPOSURE (L_{DN})						
	55	60	65	70	75	80	
Single-Family Residential							
Multi-Family Residential, Hotels, and Motels							
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds							
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches							
Office Buildings, Business Commercial, and Professional							
Industrial							
	NORMALLY ACCEPTABLE Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements						
	CONDITIONALLY ACCEPTABLE Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design						
	UNACCEPTABLE New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies						

SOURCE: CITY OF BRENTWOOD GENERAL PLAN, 2014.

TABLE 4.2-3: STATIONARY (NON-TRANSPORTATION) NOISE SOURCE STANDARDS

LAND USE RECEIVING THE NOISE	HOURLY NOISE-LEVEL DESCRIPTOR	EXTERIOR NOISE-LEVEL STANDARD (DBA)	
		DAYTIME (7AM-10PM)	NIGHTTIME (10PM-7AM)
Residential	L_{eq}	55	45
	L_{max}	70	65

NOTES:

- A) THE RESIDENTIAL STANDARDS APPLY TO ALL PROPERTIES THAT ARE ZONED FOR RESIDENTIAL USE. THE EXTERIOR NOISE LEVEL STANDARD IS TO BE APPLIED AT THE PROPERTY LINE OF THE RECEIVING LAND USE OR AT A DESIGNATED OUTDOOR ACTIVITY AREA (AT THE DISCRETION OF THE COMMUNITY DEVELOPMENT DIRECTOR) OF THE NEW DEVELOPMENT. FOR MIXED-USE PROJECTS, THE EXTERIOR NOISE LEVEL STANDARD MAY BE WAIVED (AT THE DISCRETION OF THE COMMUNITY DEVELOPMENT DIRECTOR) IF THE PROJECT DOES NOT INCLUDE A DESIGNATED ACTIVITY AREA AND MITIGATION OF PROPERTY LINE NOISE IS NOT PRACTICAL. THESE NOISE LEVEL STANDARDS DO NOT APPLY TO RESIDENTIAL UNITS ESTABLISHED IN CONJUNCTION WITH INDUSTRIAL OR COMMERCIAL USES (E.G., CARETAKER DWELLINGS). THE CITY CAN IMPOSE STANDARDS THAT ARE MORE RESTRICTIVE THAN SPECIFIED ABOVE BASED UPON DETERMINATION OF EXISTING LOW AMBIENT NOISE LEVELS.
- B) EACH OF THE NOISE LEVELS SPECIFIED ABOVE SHALL BE LOWERED BY 5 DBA FOR TONAL NOISES CHARACTERIZED BY A WHINE, SCREECH, OR HUM, NOISES CONSISTING PRIMARILY OF SPEECH OR MUSIC, OR RECURRING IMPULSIVE NOISES. IN NO CASE SHALL MITIGATION BE REQUIRED TO A LEVEL THAT IS LESS THAN EXISTING AMBIENT NOISE LEVELS, AS DETERMINED THROUGH MEASUREMENTS CONDUCTED DURING THE SAME OPERATIONAL PERIOD AS THE SUBJECT NOISE SOURCE.
- C) IN SITUATIONS WHERE THE EXISTING NOISE LEVEL EXCEEDS THE NOISE LEVELS INDICATED IN THE ABOVE TABLE, ANY NEW NOISE SOURCE MUST INCLUDE MITIGATION THAT REDUCES THE NOISE LEVEL OF THE NOISE SOURCE TO THE EXISTING LEVEL PLUS 3 DB.
- D) EXTERIOR NOISE EXPOSURE LEVEL NOT EXCEEDING 65 DB L_{DN} IS ALLOWED ALONG THE STATE ROUTE 4 CORRIDOR, THE UNION PACIFIC RAILROAD CORRIDOR, AND ARTERIAL ROADWAYS.

SOURCE: CITY OF BRENTWOOD GENERAL PLAN, 2014.

EXISTING NOISE LEVELS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop L_{dn} (24-hour average) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO 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 predicts hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the project by W-Trans Traffic Engineering. Day/night traffic distributions were based upon continuous hourly noise measurement data and j.c. brendan & associates, Inc. file data for similar roadways. Caltrans vehicle truck counts were obtained for SR 4. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 4.2-4 shows the results of this analysis.

TABLE 4.2-4: PREDICTED EXISTING TRAFFIC NOISE LEVELS

<i>ROADWAY</i>	<i>SEGMENT</i>	<i>NOISE LEVEL AT CLOSEST RECEPTORS (DB, L_{DN})¹</i>	<i>DISTANCE TO 70 DB L_{DN} NOISE CONTOUR</i>	<i>DISTANCE TO 65 DB L_{DN} NOISE CONTOUR</i>	<i>DISTANCE TO 60 DB L_{DN} NOISE CONTOUR</i>
Empire Avenue	N. of Lone Tree	61.2	26	56	121
Empire Avenue	South of Lone Tree	55.3	8	17	36
Empire Avenue	E. of Shady Willow	54.0	5	11	24
Hillcrest Avenue	N. of Lone Tree	59.7	14	31	67
Hillcrest Avenue	S. of Lone Tree	53.6	6	14	30
Hillcrest Avenue	N. of Sand Creek	N/A	N/A	N/A	N/A
Lone Tree Way	North of James Donlon	63.0	27	59	127
Lone Tree Way	James Donlon to Dallas Ranch	63.4	29	63	136
Lone Tree Way	Dallas Ranch to Deer Valley	62.6	26	55	119
Lone Tree Way	Deer Valley to Indian Hill	62.3	24	52	113
Lone Tree Way	Indian Hill to Hillcrest	62.3	25	53	114
Lone Tree Way	Hillcrest to Grande Vista	63.3	29	62	134
Lone Tree Way	Grande Vista to Heidorn Ranch	64.2	33	71	152
Lone Tree Way	Heidorn Ranch to Canada Valley	64.0	32	69	148
Lone Tree Way	Shady Willow to Empire	67.1	64	137	296
Lone Tree Way	Empire to Fairview	62.1	27	57	123
Lone Tree Way	Fairview to O'Hara	61.0	23	49	106
Lone Tree Way	O'Hara to Adams	68.3	39	83	180
Lone Tree Way	Adams to Brentwood	67.1	32	69	149
Lone Tree Way	East of Brentwood	61.4	21	46	99
Sand Creek Road	Hillcrest to Heidorn Ranch	N/A	N/A	N/A	N/A
Sand Creek Road	Herndon Ranch to SR 4	N/A	N/A	N/A	N/A
Sand Creek Road	SR 4 to Shady Willow	67.3	66	142	305
Sand Creek Road	Shady Willow to Fairview	63.6	28	61	131
Sand Creek Road	East of Fairview	63.0	26	55	119

4.0 HAZARDS, SAFETY, AND NOISE

<i>ROADWAY</i>	<i>SEGMENT</i>	<i>NOISE LEVEL AT CLOSEST RECEPTORS (DB, L_{DN})¹</i>	<i>DISTANCE TO 70 DB L_{DN} NOISE CONTOUR</i>	<i>DISTANCE TO 65 DB L_{DN} NOISE CONTOUR</i>	<i>DISTANCE TO 60 DB L_{DN} NOISE CONTOUR</i>
Shady Willow Lane	S. of Lone Tree	59.9	16	34	74
Shady Willow Lane	N. of Grant	58.5	13	27	59
Shady Willow Lane	Grant to Empire	57.6	11	24	52
Shady Willow Lane	Empire to Sand Creek	59.2	14	31	66
SR 4	North of Sand Creek	63.3	266	574	1236
SR 4	Sand Creek to Balfour	66.0	109	234	505

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.

¹ TRAFFIC NOISE LEVELS ARE PREDICTED AT THE CLOSEST SENSITIVE RECEPTORS

SOURCE: W-TRANS TRANSPORTATION ENGINEERS, CALTRANS, J.C. BRENNAN & ASSOCIATES, INC., 2016.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each Specific Plan Area roadway segments. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the Specific Plan Area roadway segments analyzed. Where sound walls were found to shield the majority of sensitive receptors along a particular roadway segment, a -5 dB correction was applied to the traffic noise modeling.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 4.2-4 are generally considered to be conservative estimates of noise exposure along roadways in the Specific Plan Area.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational, and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day, and existing ambient noise levels.

In Brentwood, fixed noise sources typically include parking lots, loading docks, parks, schools, and other commercial/retail use noise sources (HVAC, exhaust fans, etc.)

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

4.0 HAZARDS, SAFETY, AND NOISE

Fixed noise sources which are typically of concern include but are not limited to the following:

- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Transformers
- Pile Drivers
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Cooling Towers /
Evaporative Condensers

The types of uses which may typically produce the noise sources described above include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, special events such as concerts, and athletic fields. Typical noise levels associated with various types of stationary noise sources are shown in Table 4.2-5.

TABLE 4.2-5: TYPICAL STATIONARY SOURCE NOISE LEVELS

USE	NOISE LEVEL AT 100 FEET, L_{EQ}^1	DISTANCE TO NOISE CONTOURS, FEET			
		50 DB L_{EQ} (NO SHIELDING)	45 DB L_{EQ} (NO SHIELDING)	50 DB L_{EQ} (WITH 5 DB SHIELDING)	45 DB L_{EQ} (WITH 5 DB SHIELDING)
Auto Body Shop	56 dB	200	355	112	200
Auto Repair (Light)	53 dB	141	251	79	141
Busy Parking Lot	54 dB	158	281	89	158
Cabinet Shop	62 dB	398	708	224	398
Car Wash	63 dB	446	792	251	446
Cooling Tower	69 dB	889	1,581	500	889
Loading Dock	66 dB	596	1,059	335	596
Lumber Yard	68 dB	794	1,413	447	794
Maintenance Yard	68 dB	794	1,413	447	794
Outdoor Music Venue	90 dB	10,000	17,783	5,623	10,000
Paint Booth Exhaust	61 dB	355	631	200	355
School Playground / Neighborhood Park	54 dB	158	281	89	158
Skate Park	60 dB	316	562	178	316
Truck Circulation	48 dB	84	149	47	84
Vendor Deliveries	58 dB	251	446	141	251

¹ ANALYSIS ASSUMES A SOURCE-RECEIVER DISTANCE OF APPROXIMATELY 100 FEET, NO SHIELDING, AND FLAT TOPOGRAPHY. ACTUAL NOISE LEVELS WILL VARY DEPENDING ON SITE CONDITIONS AND INTENSITY OF THE USE. THIS INFORMATION IS INTENDED AS A GENERAL RULE ONLY, AND IS NOT SUITABLE FOR FINAL SITE-SPECIFIC NOISE STUDIES.

SOURCE: J.C. BRENNAN & ASSOCIATES, INC. 2016.

COMMUNITY NOISE SURVEY

A community noise survey was conducted to document ambient noise levels at various locations throughout the Specific Plan Area. Short-term noise measurements were conducted at six locations from November 9th to 10th, 2016. In addition, three continuous 24-hour noise monitoring sites were also conducted to record day-night statistical noise level trends along the project corridor. The data collected

included the hourly average (L_{eq}), median (L_{50}), and the maximum level (L_{max}) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 4.2-6 and Table 4.2-7. Figure 4.2-1 shows the locations of the noise monitoring sites.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 820 and 824 precision integrating sound level meters equipped with LDL ½" microphones. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

TABLE 4.2-6: EXISTING CONTINUOUS 24-HOUR AMBIENT NOISE MONITORING RESULTS – MEASURED HOURLY NOISE LEVELS, DBA LOW-HIGH (AVERAGE)

SITE	LOCATION	L_{DN}	DAYTIME L_{EQ}	DAYTIME L_{50}	DAYTIME L_{MAX}	NIGHTTIME L_{EQ}	NIGHTTIME L_{50}	NIGHTTIME L_{MAX}
A	East of Shady Willow Lane, 60 ft from centerline	63	59-64 (63)	52-60 (57)	74-87 (79)	48-59 (54)	40-53 (46)	71-76 (73)
B	West of Heidorn Ranch Road, 80 ft from centerline	62	46-64 (57)	44-60 (51)	63-93 (74)	48-60 (56)	46-58 (53)	58-88 (67)
C	West of Highway 4, east of Heidorn Ranch Road, 135 ft from Highway centerline	71	65-68 (66)	64-67 (65)	76-94 (82)	58-68 (64)	55-67 (61)	71-84 (77)

NOTE: DAYTIME IS DEFINED AS 7:00 A.M. – 10:00 P.M. NIGHTTIME IS DEFINED AS 10:00 P.M. TO 7:00 A.M.

SOURCE : J.C. BRENNAN & ASSOCIATES, INC. , 2016.

TABLE 4.2-7: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS

SITE	LOCATION	TIME ¹	MEASURED SOUND LEVEL, DB L_{EQ}	MEASURED SOUND LEVEL, DB L_{50}	MEASURED SOUND LEVEL, DB L_{MAX}	NOTES
1	South of Lone Tree Plaza Dr., 72 ft from centerline	1:17 p.m. 11/9/16	51	50	65	Highway 4 traffic and nearby shopping center
2	East of Heidorn Ranch Rd. 185 ft from centerline, 45 ft away from private road	1:44 p.m. 11/9/16	48	48	64	Nearby farm animals, traffic from Highway 4 and Heidorn Ranch Road.
3	East of Heidorn Ranch Rd., north of Old Sand Creek Road, 41 ft from centerline	10:18 a.m. 11/10/16	54	54	57	Idling PG&E truck and distant freight train horn. In the vicinity of a construction site
4	West of Shady Willow Lane, South of Empire Avenue, 102 ft from centerline	11:55 a.m. 11/10/16	60	55	73	Traffic from Shady Willow Lane and Empire Avenue
5	South of Amber Lane, West of Shady Willow Lane, 1347 ft from centerline	11:24 a.m. 11/10/16	50	49	57	Traffic from Highway 4
6	West of Cobalt Lane, West of Shady Willow Lane, 645 ft from centerline	10:55 a.m. 11/10/16	52	51	62	Church traffic and outdoor play area. Traffic from Lone Tree Way and Shady Willow Lane

NOTE: ¹ ALL COMMUNITY NOISE MEASUREMENT SITES HAVE A TEST DURATION OF 10:00 MINUTES.

SOURCE - J.C. BRENNAN & ASSOCIATES, INC. 2016.

The results of the community noise survey shown in Tables 4.2-6 and 4.2-7 indicate that existing transportation (traffic) noise sources were the major contributor of noise observed during daytime hours, especially during vehicle passbys. Existing noise sources within the vicinity of the Specific Plan Area include traffic from Highway 4, Heidorn Ranch Road and Shady Willow Lane, retail and commercial shopping centers, and activities at the Lighthouse Baptist Church.

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Legend

 : Continuous (24-hr) Noise Measurement Site

 : Short-Term Traffic Noise Measurement Site

Brentwood Priority Area 1 Specific Plan
 Figure 4.5-1: Noise Monitoring Location

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5.0 CONSERVATION AND NATURAL RESOURCES

The City of Brentwood's natural resources form an important part of its unique character and quality of life. In an effort to identify and understand the key natural resources of the city, and of the Specific Plan Area, this chapter is divided into the following sections:

- 5.1 Cultural and Historic Preservation
- 5.2 Biological Resources
- 5.3 Air Quality and Greenhouse Gases
- 5.4 Geology, Soils and Seismicity
- 5.5 Mineral and Energy Resources
- 5.6 Hydrology and Water Quality
- 5.7 Aesthetics and Visual Resources

5.1 CULTURAL AND HISTORIC PRESERVATION

These resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. Preservation of the city's cultural heritage should be considered when planning for the future.

KEY TERMS

Archaeology. The study of historic or prehistoric peoples and their cultures by analysis of their artifacts and monuments.

Complex. A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archaeological culture.

Ethnography. The study of contemporary human cultures.

Midden. A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

Paleontology. The science of the forms of life existing in former geologic periods, as represented by their fossils.

REGULATORY SETTING

FEDERAL

National Historic Preservation Act

Most regulations at the Federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for Federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any Federal agency and which have the potential to affect cultural resources.

All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

American Indian Religious Freedom Act and Native American Graves and Repatriation Act

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains are protected by the Native American Graves and Repatriation Act of 1990.

Other Federal Legislation

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archaeological sites. It established a system of permits for conducting archaeological studies on Federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archaeological sites on Federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance."

STATE

California Register of Historic Resources (CRHR)

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in documents prepared pursuant to the California Environmental Quality Act (CEQA). Under CEQA, a cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the CRHR. Historic properties listed, or formally designated for eligibility to be listed, on The National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

California Environmental Quality Act (CEQA)

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as "unique," "important," listed on the California Register of Historic Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- identify cultural resources,
- evaluate the significance of the cultural resources found,
- evaluate the effects of the project on cultural resources, and
- develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources in a project's area of potential affect, assessment of potential impacts on significant or unique resources, and development of mitigation measures for potentially significant impacts, which may include monitoring combined with data recovery and/or avoidance.

State Laws Pertaining to Human Remains

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-Federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

Several sections of the California Public Resources Code protect paleontological resources.

Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any "vertebrate paleontological site, including fossilized footprints," on public lands, except where the agency with jurisdiction has granted express permission. "As used in this section, 'public lands' means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof."

California Public Resources Code, Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

The sections of the California Administrative Code relating to the State Division of Beaches and Parks afford protection to geologic features and "paleontological materials" but grant the director of the State park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are in the interest of the State park system and for State park purposes (California Administrative Code, Title 14, Section 4307 – 4309).

Senate Bill 18 (Burton, Chapter 905, Statutes 2004)

SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004, requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places (“cultural places”) through local land use planning. This legislation, which amended §65040.2, §65092, §65351, §65352, and §65560, and added §65352.3, §65352.4, and §65562.5 to the Government Code; also requires the Governor’s Office of Planning and Research (OPR) to include in the General Plan Guidelines advice to local governments on how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

LOCAL

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following goals and policies related to cultural resources:

Conservation and Open Space Element

GOAL COS-6: Preserve and enhance prehistoric, historic and cultural resources in and around the Brentwood Community.

Policy COS 6-1: Protect important historic resources and use these resources to promote a sense of place and history in Brentwood.

Policy COS 6-2: Encourage the voluntary identification, conservation, and reuse of historical structures, properties, and sites with special and recognized historic, architectural, or aesthetic value.

Policy COS 6-3: Encourage historic resources to remain in their original use whenever possible. The adaptive use of historic resources is preferred, particularly as museums, educational facilities, or visitor-serving uses, when the original use can no longer be sustained. Older residences may be converted to office/retail use in commercial areas and to tourist or business use, so long as their historical authenticity is maintained or enhanced.

Policy COS 6-4: Leverage the city’s strong cultural and historic heritage to support and encourage historically-oriented visitor programs and heritage tourism through cooperation with local, regional, and State marketing efforts.

Policy COS 6-5: Continue to support and promote annual festivals and community events that celebrate Brentwood’s cultural heritage.

Policy COS 6-6: Encourage and support community art projects, including murals, sculptures, educational programs, and events that highlight Brentwood’s cultural and historic heritage.

Policy COS 6-7: Review new development projects and work in conjunction with the California Historical Resources Information System to determine whether project areas contain known archaeological resources, either prehistoric and/or historic-era, or have the potential for such resources.

Policy COS 6-8: Ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.

Policy COS 6-9: Consistent with State, local, and tribal intergovernmental consultation requirements such as SB 18, the City shall consult as necessary with Native American tribes that may be interested in proposed new development and land use policy changes.

Action COS 6a: Explore the development of an historic Brentwood program to identify historic resources, encourage landowners to voluntarily preserve and rehabilitate historical structures, and provide a coordinated approach to draw visitors and tourists to these areas.

Action COS 6b: Develop guidelines for remodels of potentially historic residential structures to ensure that the character and individuality of such residences is maintained. The guidelines should address:

1. Design styles, age of home, and other criteria to determine applicability of the guidelines.
2. Exterior features that are important and covered by the guidelines (e.g., siding and exterior finishes, windows, doors, roofs, porches, garages, outbuildings, and streetscapes).
3. Standards for modifications and renovation, including the extent of changes that can occur.
4. Activities that are exempt from the guidelines, such as interior improvements and routine maintenance and repair.

Action COS 6c: Collaborate with the Chamber of Commerce and other interested community groups to support and promote community festivals and events.

Action COS 6d: Require a cultural and archaeological survey prior to approval of any project which would require excavation in an area that is sensitive for cultural or archaeological resources. If significant cultural or archaeological resources, including historic and prehistoric resources, are identified, appropriate measures shall be implemented, such as documentation and conservation, to reduce adverse impacts to the resource.

Action COS 6e: Require all new development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:

1. If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Community Development Director shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Community Development Director.

2. If human remains are discovered during any ground disturbing activity, work shall stop until the Community Development Director and the Contra Costa County Coroner have been contacted; if the human remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) and the most likely descendants have been consulted; and work may only resume when appropriate measures have been taken and approved by the Community Development Director.

PREHISTORY

Dissatisfaction with the Central California Taxonomic System, with its emphasis on widespread and presumed more-or-less coeval cultural developments, led to the now familiar system employing the terms pattern, phase, aspect, facies and other designations for related cultural expressions. The main thrust has been to recognize that certain widespread cultural developments exist, but these do not have to occur at the same time in all geographic areas or be expressed in the same way. The North Coast and northern Bay Areas were among the first to use this system (Fredrickson 1973) and accumulated archeological knowledge in this area has been reflected in development of the integrative system (Fredrickson 1984, Milliken et al. 2007).

At the same time, detailed studies of shell bead types by Bennyhoff resulted in adjustments to previously accepted chronologies. Again, much of the change in chronological systems has involved local inception of a more widely seen pattern or aspect. This chronology based on bead typology has also seen refinements and revisions (Bennyhoff and Hughes 1984, Elsasser 1978, Groza 2002).

In the 1990s, the extensive studies and numerous reports resulting from the Los Vaqueros Reservoir Project provided a much better understanding of archeological succession in the Contra Costa region than is available in most areas of California. It is presumed that the early period of prehistory reflected a material culture and way of life similar to the Borax Lake Pattern, although no good examples of this cultural expression are known in the region. If this assumption is correct, then the way of life of the earliest occupants would have been a forager strategy based on considerable population movement, probably in an annual cycle. Other interpretations are possible, however, since no sites in the area are securely dated to the period before 8,000 BC.

The Early Holocene (or Lower Archaic), dated to 3,500 to 8,000 BC, appears to involve a generalized forager settlement pattern. This involves a great deal of mobility within a circumscribed range and exploitation of whatever foods are available. Few components of this age are known in the region, so there is relatively little detail available.

The Early Period (Middle Archaic) is dated to 500 to 3,500 BC. This marks the introduction of cut bead technology, which will be increasingly important in the economy through the rest of regional prehistory. This marks a more sedentary settlement pattern also marked by a burial pattern with ornaments as grave goods, increased trade volume, and the development of large shells mounds along the Bay margins.

The Lower Middle Period (Initial Upper Archaic), 500 BC to AD 430, is marked by a rather sudden shift in favored bead types. Rectangular *Olivella* beads, common over a wide area in the Early Period, disappeared altogether.

During the Upper Middle Period (Late Upper Archaic), AD 430 to AD 1050, another sudden and widespread change in bead typology occurred. This probably represents a collapse of the trade network established in the previous period. Many of the sites occupied in the previous period are abandoned and a new burial pattern, the Meganos complex, spreads through the East Bay region.

The Initial Late Period (Lower Emergent) is essentially an intensification of the previous period. From AD 1,050 to 1,550, the degree of complexity and artistry shown in wealth items increases, there appears to be separate burial modes for wealthy individuals in some areas and, in general, status ascription is more obvious in the archeological record

The Terminal Late Period sees a collapse in the characteristics of the cultural climax achieved in the Initial Late Period. The reasons for this are not clear. Population growth pressure, mass population movement, and diseases spreading north from the Spanish contacts farther south, have all been blamed. In any event, prehistoric society in the region was beginning to develop in new ways when the Spanish arrived.

ETHNOLOGY

Bay Miwok

Linguistic data suggest that the Miwok have resided in the Delta of the Sacramento and San Joaquin rivers for approximately 2,500 years. The Bay Miwok occupied an area south of the Sacramento River, including portions of Contra Costa County east of present-day Walnut Creek. Bay Miwok, like the Costanoans, situated their villages on elevations above the seasonal marshes. Father Viader described the summer flooding of the rivers and said that "at that time the wild Indians live on a few small elevations" (Cook 1960:259). Cook categorized these elevations as two types:

- (1) small, scattered mounds formed of residual calcareous sand (the so-called "sand mounds") on the summits of which the Indians established their villages; and
- (2) true habitation mounds, perhaps originally situated on a slight elevation, but built up by midden deposit to a height of several feet [Cook 1960:285].

Large, multilineage villages situated along waterways were occupied throughout the year except during the autumn acorn harvest. Single extended families occupied domed houses that were covered with tule mats and grass thatch. Wealthy men sometimes built semi-subterranean lodges. The Miwok also constructed assembly houses in the major villages and round, earth-covered semi-subterranean sweathouses used by men.

The Delta environment provided abundant food sources for the Miwok, including grasses, berries, and other plants, fish, and waterfowl, and herds of elk and deer. The Miwok used many of the same species as did the Costanoans. Their economy was based primarily on gathering plant foods. Fishing and hunting waterfowl and mammals were subsidiary subsistence activities. The Miwok relied on the acorn as a staple in their diet. Valley oak (*Quercus lobata*) yielded large crops, and the Miwok presumably gathered other acorn varieties as well. Women ground the acorns into a meal that they cooked as a gruel. The Bay Miwok supplemented this food by collecting seeds, nuts, roots, berries, and greens. The Miwok organized communal activities, such as hunting drives and fishing with nets and weirs (Bennyhoff 1977:10-11). Salmon were seasonally plentiful, and Viader observed Indians with large catches of fish (Cook 1960:258). Individual hunting skill may have been weakly developed. Although the Miwok used sinew-back bows and a variety of arrows, they often chose to run down their game and, after contact, many found it easier to steal horses and cattle than to rely on hunting game. Birds, rodents, and other small mammals apparently took a place in the Miwok diet more consistently than did deer, elk, or antelope (Bennyhoff 1977:10-11).

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In 1774, the first Bay Miwok converts were recorded at Mission San Francisco, although most of the Bay Miwok neophytes were taken to Mission San Jose. Some of those who escaped the rigid life at the missions hid in the tule marshes and sought protection from extant villages; but Spanish expeditions used military force to recapture runaways and discourage the villagers from harboring fugitives (Cook 1960:258-259). The last Bay Miwok baptisms were recorded in 1827. Subsequently, the original tribal groups lost their identity, it has been suggested, by joining more distant tribelets or because they were decimated by disease (Bennyhoff 1977:23; Levy 1978:400).

The Bay Miwok village site of *Bolbon* was located on the southeast flanks of Mount Diablo, about three miles south of the Planning Area. From 1803 to 1813, 67 Miwok were recorded to have been baptized by the padres at the village (Levy 1978: Figure 1; 399). The village name, *Bolbones* was assigned to the local Bay Miwok tribe and tribelets in the general Project area.

HISTORIC PERIOD BACKGROUND

The first intrusion of Hispanic peoples into the area of modern Contra Costa County was accomplished by Pedro Fages, who toured the country with twelve soldiers an Indian guide and Father Juan Crespi in the spring of 1772 (Bancroft 1882). This expedition was followed in 1776 by a party led by Captain Juan Bautista de Anza that generally followed along the same route from San Francisco Bay to the Carquinez Straits, continued toward the interior, and passed somewhere east of Mt. Diablo (Beck and Haase 1974:17).

The Franciscan order of missionary priests served as the principal agency of Spain's imperial expansion into Alta California. The Franciscan missions became centers for the introduction of Hispano-European agriculture, bringing to Alta California a wide assortment of exotic food plants, weeds, and domestic animals that quickly became established and began an ecological transformation of the countryside.

After the 1821 Mexican Revolution, the Franciscan order faced an increasingly strong challenge to its hegemony over the converted Indians and the landed resources of Hispanic California. Amid substantial political and religious controversy, the mission system remained intact through the first decade of independence, but after 1834, the missions were secularized and Franciscan control phased out. The largest part of the mission landholdings came into the hands of opportunistic Spanish colonists, including many retired soldiers and sons of soldiers, who became leaders in developing a hacienda system built around a frontier ranching economy that came to characterize Mexican California during the late 1830s and the 1840s (Weber 1982).

In the project vicinity, the hacienda was Rancho Los Meganos, with a portion of the Specific Plan Area located on the westernmost portion of the land grant. This land grant was originally acquired by Jose Noriega in 1834, and sold to John Marsh in 1837.

A major change in the region was the completion of the San Pablo and Tulare Railroad Company (later the Southern Pacific) railroad line in 1878 from Martinez to Banta, creating a direct route from Contra Costa County to the San Joaquin Valley and connecting railroad lines. Towns such as Byron and Brentwood were established along the line of the railroad as shipping points, with communities growing up along these lines.

Although part of Brentwood now, the Specific Plan Area lies close to Antioch. Antioch is one of the oldest towns in California, having been founded in 1850 by two brothers, William and Joseph Smith, who named the town Smith's Landing. In 1851, the town's new minister persuaded the residents to change the name of the town to Antioch, for the biblical city of Antioch.

Around 1859, coal was discovered in several places in the hills south of Antioch and coal mining formed the first substantial business apart from farming and dairying by the inhabitants of this community. This new industry resulted in the founding of the towns of Nortonville, Somersville, Stewartsville, and Black Diamond (now Pittsburg, California), and added greatly to the economic activity of the Antioch area. The Empire Coal Company was formed by John C. Rouse and George Hawxhurst in 1876, which built a railroad that passed from Antioch toward the mines over what is currently F Street (formerly Kimball Street). The mines have long ago ceased operation, and the railroad tracks have been removed.

In 1863, a great excitement arose over the discovery of copper ore near Antioch. Smelting works were built at Antioch, and a value of \$15 to \$25 per ton was paid for the ore, according to its quality. Unfortunately, the copper bubble eventually burst to the dismay of the citizens with connections. Petroleum was first drilled for near Antioch in 1865, but not enough oil was found to make a decent profit.

Until a recent population explosion due to housing for rapidly growing commercial interests nearby, Brentwood was a center for another economic staple of the region: agricultural production. The area proved to be an excellent location for several orchard crops. The Specific Plan Area and hundreds of acres around it were covered in walnut and almond orchards.

METHODOLOGY

Records Search

Records of previously recorded cultural resources and cultural resource investigations were examined by the Northwest Information Center (NWIC) of the California Historical Resources Information System on November 8, 2016 for the Specific Plan Area (NWIC File # 16-0575), and surrounding 500-foot radius. Their report indicates that several portions of the Specific Plan Area have been subject to a number of small surveys related to development projects and larger scale linear cultural resource surveys, as well as several cultural resource overviews.

Despite the number of surveys in the Specific Plan Area, no prehistoric sites, historic sites, or historic buildings have been recorded. The only resource reported in the Specific Plan Area is a culvert under Sand Creek Road that appears to have been covered by the construction of Highway 4. Several historic sites have been recorded in the vicinity of the Specific Plan Area.

Pre-Field Research

In addition to the NWIC record search, historic topographic maps and other County maps were reviewed for further information on the locations of historic buildings. The 1914 Brentwood USGS topographic map for the area indicates the presence of two buildings, one of which is still present in 1954 (Brentwood USGS topographic quadrangle). By 1954, three other buildings/building complexes had been added, a ditch, powerline, and most of land is covered in orchards, with the East Bay Municipal Utility District (EBMUD) Aqueduct constructed through the area.

Consultation letters were sent to two local historical groups, the Contra Costa County Historical Society and the East Contra Costa Historical Society, requesting information on issues or concerns about historical resources within the Specific Plan Area. No reply has been received to date.

Field Survey

The Specific Plan Area was subject to a complete coverage survey in December 2016 and January 2017 by Michael Lawson, covering the area with transects no wider than 20 meters. This survey covered a variety of landscapes, from recently tilled agricultural fields to landscaped areas around houses and retail buildings, to freeway medians and on/off ramp dividers. Most of the commercial development areas had been inspected for cultural resources, presumably with nothing formally recorded or remaining after the completion of the developments.

The sediments observed were remarkably similar in constituents and color, with agricultural fields tending to be slightly darker in color with more intense mixing, allowing for local stone to be more easily evaluated. Dominant soil structure appeared to be clay with a high concentration of alluvial gravels and cobbles, which are both good examples of material native to Mt. Diablo. This assemblage included a high percentage of local chert and other crypto-crystalline silicates, as well as dense and porous varieties of sandstone. Very close attention was given to all examples which could have been used as tool stone by previous human cultures.

Visibility in agricultural fields was excellent as no vegetation was present and recent heavy rains had exposed much lithic material. Ten to fifteen meter transects were employed, with occasional overlapping and closer scrutiny. The locations of two older building sites were checked, and no evidence was found of historic features or artifacts.

The landscaped areas and freeway medians all showed signs of elevation modification, with sloping, mounding, and other undulations common for drainage and esthetics. Visibility was fair to good, resultant of planted grasses, bushes and weed covering surfaces such as mulch and bark. Heavy rodent disturbance outside of residential and retail areas allowed for good visibility. Here, ten to fifteen meter transects were used, with occasional overlapping and closer examination.

Although evidence of modification was present in nearly all areas, no prehistoric resources were encountered. During the field survey, several historic period buildings and features were found and recorded within the Specific Plan Area:

- Residence and barn, now within the Golden Hills Church complex.
- Maggiore building complex on Sand Creek Road.
- Building complex on Heidorn Ranch Road.
- Unnamed open ditch.
- Unnamed powerline.

The buildings at the Golden Hills Church and the Maggiore ranch have had a number of alterations and moved buildings. Neither complex is eligible for the California Register of Historical Resources. The residence at the Heidorn Ranch Road complex appears to have a front elevation that is entirely a later addition to an original small craftsman bungalow. Due to the extensive alteration and the very common architectural style, this complex is not eligible for the California Register of Historical Resources. The two other features, the ditch and the powerline, are in no way distinctive and are not eligible for the California Register of Historical Resources.

REFERENCES

Peak & Associates. 2017. Cultural Resources Report – Brentwood Priority Area 1.

5.2 BIOLOGICAL RESOURCES

This section describes biological resources in the Specific Plan Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect biological resources in the Specific Plan Area.

KEY TERMS

The following key terms are used throughout this section to describe biological resources and the framework that regulates them:

Hydric Soils. One of the three wetland identification parameters, according to the Federal definition of a wetland, hydric soils have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. There are approximately 2,000 named soils in the United States that may occur in wetlands.

Hydrophytic Vegetation. Plant types that typically occur in wetland areas. Nearly 5,000 plant types in the United States may occur in wetlands. Plants are listed in regional publications of the U.S. Fish and Wildlife Service (USFWS) and include such species as cattails, bulrushes, cordgrass, sphagnum moss, bald cypress, willows, mangroves, sedges, rushes, arrowheads, and water plantains.

Sensitive Natural Community. A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, State, or Federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The California Department of Fish and Wildlife (CDFW) tracks sensitive natural communities in the California Natural Diversity Database (CNDDB).

Special-Status Species. Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by Federal, State, or other agencies. Some of these species receive specific protection that is defined by Federal or State endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. For the purposes of this assessment, the term "special status" includes those species that are:

- Federally listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);
- State listed or proposed for listing under the California Endangered Species Act (14 CCR 670.5);
- Species listed by the U.S. Fish and Wildlife Service (USFWS) or the CDFW as a species of concern (USFWS), rare (CDFW), or of special concern (CDFW);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380);

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- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.); and
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1A and List 2 status plants in Skinner and Pavlik 1994).

Waters of the U.S. The Federal government defines waters of the U.S. as "lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows" [33 C.F.R. §328.3(a)]. Waters of the U.S. exhibit 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)].

Wetlands. Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The Federal government defines wetlands 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)]. Wetlands require wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to waters of the U.S.

REGULATORY SETTING

There are a number of regulatory agencies whose responsibility includes the oversight of the natural resources of the State and nation including the CDFW, the U.S. Fish and Wildlife Service (USFWS), the U.S. Army Corps of Engineers (USACE), and the National Marine Fisheries Service (NMFS). These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. The following is an overview of the Federal, State, and local regulations that are applicable to implementing the Priority Area 1 Specific Plan.

FEDERAL

Federal Endangered Species Act

The Federal Endangered Species Act, passed in 1973, defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed it is fully protected from a "take" unless a take permit is issued by the United States Fish and Wildlife Service. A take is defined as the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct, including modification of its habitat (16 USC 1532, 50 CFR 17.3). Proposed endangered or threatened species are those species for which a proposed regulation, but not a final rule, has been published in the Federal Register.

Migratory Bird Treaty Act

To kill, possess, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Section 668) protects these birds from direct take and prohibits the take or commerce of any part of these species. The USFWS administers the act, and reviews Federal agency actions that may affect these species.

Clean Water Act – Section 404

Section 404 of the Clean Water Act (CWA) regulates all discharges of dredged or fill material into waters of the U.S. Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §323.2(f)].

Waters of the U.S. include lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows [33 C.F.R. §328.3(a)]. 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)]. Waters of the U.S. exhibit 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)].

The USACE is the agency responsible for administering the permit process for activities that affect waters of the U.S. Executive Order 11990 is a Federal implementation policy, which is intended to result in no net loss of wetlands.

Clean Water Act – Section 401

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board. To obtain the water quality certification, the Regional Water Quality Control Board must indicate that the proposed fill would be consistent with the standards set forth by the State.

Department of Transportation Act – Section 4(f)

Section 4(f) has been part of Federal law since 1966. It was enacted as Section 4(f) of the Department of Transportation (DOT) Act of 1966 and set forth in Title 49 United States Code (U.S.C.), Section 1653(f). In January 1983, as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 U.S.C. Section 303. This law established policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites as follows:

It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. The Secretary of Transportation may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State,

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or local significance, or land of a historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if: a) There is no prudent and feasible alternative to using that land; and b) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

STATE

Fish and Game Code §2050-2097 – California Endangered Species Act

The California Endangered Species Act (CESA) protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

CESA was expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

Fish and Game Code §1900-1913 California Native Plant Protection Act

In 1977 the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the State. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFW 10 days in advance of approving a building site.

Fish and Game Code §3503, 3503.5, 3800 – Predatory Birds

Under the California Fish and Game Code, all predatory birds in the order Falconiformes or Strigiformes in California, generally called "raptors," are protected. The law indicates that it is unlawful to take, possess, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

Fish and Game Code §1601-1603 – Streambed Alteration

Under the California Fish and Game Code, CDFW has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a "Streambed Alteration Agreement" from CDFW prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFW may impose conditions to limit and fully mitigate impacts on fish and wildlife resources. These agreements are usually initiated through the local CDFW warden and will specify timing and construction conditions, including any mitigation necessary to protect fish and wildlife from impacts of the work.

Public Resources Code § 21000 – California Environmental Quality Act

The California Environmental Quality Act (CEQA) identifies that a species that is not listed on the Federal or State endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e., candidate or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of “Species of Special Concern,” developed by the CDFW. Additionally, 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 Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened, or endangered in California, but more numerous elsewhere. List 3 contains plants where additional information is needed. List 4 contains plants with a limited distribution.

Public Resources Code § 21083.4 – Oak woodlands conservation

In 2004, the California legislature enacted SB 1334, which added oak woodland conservation regulations to the Public Resources Code. This new law requires a county to determine whether a project, within its jurisdiction, may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county must require oak woodland mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. Such mitigation alternatives include: conservation through the use of conservation easements; planting and maintaining an appropriate number of replacement trees; contribution of funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and/or other mitigation measures developed by the county.

California Oak Woodland Conservation Act

The California Legislature passed Assembly Bill 242, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodland character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation Board. The legislation provides funding and incentives to ensure the future viability of California’s oak woodland resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion, sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the State.

California Wetlands Conservation Policy

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

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- Ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and Federal wetland conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetland conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

LOCAL

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following policies related to biological resources:

Conservation and Open Space Element

GOAL COS-1: Ensure the provision and preservation of diverse and accessible open spaces throughout the Brentwood Planning Area.

Policy COS 1-1: General Plan land use designations that include agriculture, permanent open space, parks, and similar uses, as well as waterways (i.e., Marsh Creek, Dry Creek, Deer Creek, and Sand Creek), shall be considered open space.

Policy COS 1-2: Preserve open space for conservation, recreation, and agricultural uses.

Policy COS 1-3: Conversion of open space, as defined under Policy COS 1-1, to developed residential, commercial, industrial, or other similar types of uses, shall be strongly discouraged. Undeveloped land that is designated for urban uses may be developed if needed to support economic development, and if the proposed development is consistent with the General Plan Land Use Map.

Policy COS 1-4: Where possible, integrate open space and stream corridors with trails and other recreational open space in an environmentally sustainable manner.

Policy COS 1-5: Recognize urban open space as essential to maintaining a high quality of life within the city limits of Brentwood.

Policy COS 1-6: Support regional and local natural resource preservation plans of public agencies that retain and protect open space within the city limits, the Sphere of Influence, and the Planning Area.

Policy COS 1-7: Encourage public and private efforts to preserve open space.

Policy COS 1-8: Common or private open space that is not City property shall be privately maintained.

Policy COS 1-9: Encourage the protection and incorporation of existing, native, mature, non-orchard trees and areas of natural vegetation as part of new development.

Action COS 1a: Review all development proposals involving unincorporated land within the jurisdiction of Contra Costa County, and within or adjacent to the Sphere of Influence or Planning Area, to ensure adequate preservation of community separators and open space resources.

Action COS 1b: Adopt an ordinance that specifies standards and responsibilities for the maintenance of private open space lands within the city limits. The standards should include provisions for public access, habitat management, water quality protection, safety, and aesthetics.

Action COS 1c: Implement a coordinated and cost-effective plan for City management and maintenance of publicly-owned open space within the city limits.

GOAL COS-2: Preserve designated agricultural lands in Brentwood's Planning Area.

Policy COS 2-1: Support and encourage the preservation of agricultural lands throughout Brentwood's Planning Area, particularly in areas to the south and east of the city limits.

Policy COS 2-2: Maintain permanent agricultural lands surrounding the city limits to serve as community separators and continue the agricultural heritage of Brentwood.

Policy COS 2-3: Encourage and support programs that create or establish permanent agricultural areas in Brentwood's Planning Area.

Policy COS 2-4: Participate in regional planning efforts with agencies and organizations such as Contra Costa County, land trusts, and other regional partners to establish and maintain permanent agricultural areas to the south and east of Brentwood.

Policy COS 2-5: Work with the Local Agency Formation Commission (LAFCO) on issues of mutual concern including the conservation of agricultural land through consistent use of LAFCO policies, particularly those related to conversion of agricultural lands and establishment of adequate buffers between agricultural and non-agricultural uses, and the designation of a reasonable and logical Sphere of Influence (SOI) boundary for the City.

Policy COS 2-6: Minimize conflicts between agricultural and urban land uses.

Policy COS 2-7: Require the use of buffers such as greenbelts, drainage features, parks, or other improved and maintained features in order to separate residential and other sensitive land uses, such as schools and hospitals, from agricultural lands and agricultural operations.

Policy COS 2-8: Require new development to have structural setbacks that respect agricultural operations.

Policy COS 2-9: Developers shall be responsible for mitigating impacts upon nearby agriculture. Setbacks and buffers shall be provided by the developer and not encroach upon productive agricultural areas.

Policy COS 2-10: Limit incompatible uses (i.e., schools, hospitals, and high density residential) near agriculture.

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Policy COS 2-11: Work with agricultural landowners to improve practices that have resulted in adverse impacts to adjacent properties. Such practices include site drainage and flood control measures.

Policy COS 2-12: Promote best management practices in agricultural operations to reduce emissions, conserve energy and water, and utilize alternative energy sources.

Policy COS 2-13: Assist agricultural landowners and farmers with a variety of programs aimed at preserving agricultural lands, increasing opportunities for local sales of agricultural products, and increasing access to local commodities markets.

Policy COS 2-14: Encourage agricultural landowners in Brentwood's Planning Area to participate in Williamson Act contracts and other programs that provide long-term protection of agricultural lands.

GOAL COS-3: Protect and enhance Brentwood's ecosystem and natural habitats.

Policy COS 3-1: Sensitive habitats include creek corridors, wetlands, vernal pools, riparian areas, wildlife and fish migration corridors, native plant nursery sites, waters of the United States, sensitive natural communities, and other habitats designated by State and Federal agencies.

Policy COS 3-2: Preserve and enhance those biological communities that contribute to Brentwood's and the region's biodiversity including, but not limited to, wetlands, riparian areas, aquatic habitat, and agricultural lands.

Policy COS 3-3: Focus conservation efforts on high priority conservation areas that contain suitable habitat for endangered, threatened, migratory, or special-status species and that can be managed with minimal interference with nearby urban land uses.

Policy COS 3-4: Conserve existing native vegetation where possible and integrate regionally native plant species into development and infrastructure projects where appropriate.

Policy COS 3-5: Avoid removal of large, mature trees that provide wildlife habitat or contribute to the visual quality of the environment to the greatest extent feasible through appropriate project design and building siting. If full avoidance is not possible, prioritize planting of replacement trees on-site over off-site locations.

Action COS 3a: Require new development, as well as infrastructure projects, long-range planning projects, and other projects, to comply with the requirements of the East Contra Costa County Habitat Conservation Plan / Natural Community Conservation Plan to ensure that potentially significant impacts to special-status species and sensitive resources are adequately addressed

Action COS 3b: Where sensitive biological habitats have been identified on or immediately adjacent to a project site, the project shall include appropriate mitigation measures identified by a qualified biologist.

Action COS 3c: Develop CEQA Thresholds of Significance to assist staff, project applicants, and decision-makers in determining whether a project may have a significant effect on the environment under Section 21082.2 of the California Environmental Quality Act (CEQA).

GOAL COS-4: Protect and enhance water resources in local creeks, riparian habitat, wetlands, the Marsh Creek Watershed, and aquatic habitat.

Policy COS 4-1: Where feasible, protect and enhance surface water quality in creeks, streams, channels, seasonal and permanent marshland, wetlands, sloughs, riparian habitat, and vernal pools through sound land use planning, community design, and site planning.

Policy COS 4-2: Rehabilitate existing channelized waterways, as feasible, to remove concrete linings and allow for a connection with the stream channel and the natural water table. Avoid creating additional channelized waterways, unless no other alternative is available to protect human health, safety, and welfare.

Policy COS 4-3: Where feasible, restore existing channelized waterways to a more natural condition. Restoration efforts should provide for naturalized hydraulic functioning. Restoration should also promote the growth of riparian vegetation to effectively stabilize banks, screen pollutants from runoff entering the channel, enhance fisheries, and provide other opportunities for natural habitat restoration.

Policy COS 4-4: Require discretionary projects, as well as new flood control and storm water conveyance projects, to integrate best management practices and natural features to the greatest extent feasible, while ensuring that these features adequately convey and control storm water to protect human health, safety, and welfare.

Policy COS 4-5: Encourage the use of natural features such as bio swales, vegetation, retention ponds, and other measures to remove storm water pollutants prior to discharge, subject to State regulations.

Policy COS 4-6: Where feasible, new development adjacent to creeks and streams should include opportunities for beneficial uses, such as flood control, ecological restoration, public access trails, and walkways.

Policy COS 4-7: Consult with State and Federal agencies during the development review process to help identify wetland and riparian habitat that has candidacy for restoration, conservation, and/or mitigation. Focus restoration and/or conservation efforts on areas that would maximize multiple beneficial uses for such habitat.

Policy COS 4-8: Conserve riparian habitat along local creeks, including but not limited to Marsh Creek, Deer Creek, Dry Creek, and Sand Creek, in order to maintain water quality and provide suitable habitat for native fish and plant species.

Policy COS 4-9: Consider the effects of development on ground and surface water quality, and implement measures to reduce water contamination.

Policy COS 4-10: Where feasible, encourage and support multipurpose detention basins that provide water quality protection, storm water detention, open space amenities, and recreational amenities.

Action COS 4a: Coordinate with interested public and private entities to create new and expanded public access trails along creeks and streams that connect to parks and open space areas within Brentwood's Planning Area.

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Action COS 4b: Continue to identify which storm water and drainage facilities are in need of repair and address these needs through the City's Capital Improvement Program.

Action COS 4c: Utilize existing regulations and procedures, including but not limited to, the Zoning Ordinance and the environmental review process, in order to conserve wetlands and riparian habitat within the city limits and the Planning Area.

Action COS 4d: Coordinate with the California Department of Fish and Wildlife, Contra Costa County, and local watershed protection groups to identify potentially impacted aquatic habitat within Brentwood's Planning Area and to develop riparian management guidelines to be implemented by development, recreation, and other projects adjacent to creeks, streams, and other waterways.

Action COS 4e: Continue to implement, and periodically review/update as necessary, Chapter 15.52 (Grading, Erosion and Sediment Control) of the Brentwood Municipal Code. The City shall review projects to ensure that best management practices are implemented during construction and site grading activities, as well as in project design to reduce pollutant runoff into water bodies.

Action COS 4f: Explore revising Title 17 (Zoning) of the Brentwood Municipal Code to include standards for creek setbacks and the protection of riparian habitat along creek corridors. The standards should include minimum setback requirements, site design standards, and requirements for the ongoing maintenance of creek and riparian habitat on public and private lands.

Action COS 4g: Update the Creek Trails and Revegetation Master Plan. Solicit public input during the preparation of the update, and include outreach efforts to community organizations with knowledge of and interest in key issues associated with local creeks, trails, and habitat restoration.

Action COS 4h: Encourage volunteer-based programs that organize community creek restoration and/or clean-up events and provide public education regarding the benefits of city and regional water resources.

Action COS 4i: Provide a conservation page (or similar page) on the City's website that provides links to resource agencies (i.e., CDFW, USFWS, USACE, etc.) and provides information regarding local and regional conservation and environmental programs, to the extent that the City has readily available information.

GOAL COS-9: Promote conservation of energy and other natural resources.

Policy COS 9-9: Encourage and support the use of drought-tolerant and regionally native plants in landscaping.

Action COS 9g: Develop a list of drought-tolerant and native plants appropriate for use in Brentwood and review development projects for adherence to this list.

East Contra Costa County Habitat Conservation Plan

The East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP or Plan) is intended to provide regional conservation and development guidelines to protect

natural resources while improving and streamlining the permit process for endangered species and wetland regulations. The Plan was developed by a team of scientists and planners with input from independent panels of science reviewers and stakeholders. Within the 174,018-acre inventory area, the Plan will provide permits for between 8,670 and 11,853 acres of development and will permit impacts on an additional 1,126 acres from rural infrastructure projects. The Preserve System to be acquired under the Plan will encompass 23,800 to 30,300 acres of land that will be managed for the benefit of 28 species as well as the natural communities that they, and hundreds of other species, depend upon. By proactively addressing the long-term conservation needs, the Plan strengthens local control over land use and provides greater flexibility in meeting other needs such as housing, transportation, and economic growth in the area. The City of Brentwood approved an ordinance in 2007 that requires future development projects to comply with the HCP/NCCP.

ENVIRONMENTAL SETTING

The City of Brentwood is located in eastern Contra Costa County, California approximately 50 miles east of San Francisco and 50 miles southwest of Sacramento. Brentwood is situated in the western portion of the San Joaquin Valley, immediately east of the Diablo Range which forms the eastern boundary of the Coast Ranges. The Specific Plan Area is located in the northwestern portion of the City.

Bioregions

The City of Brentwood is located within the Bay Area/Delta bioregion. A brief description of the Bay Area/Delta bioregion is presented below.

Bay Area/Delta Bioregion: The Bay Area/Delta Bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra Bioregion at Amador and Calaveras counties. The bioregion is bounded by the Klamath/North Coast on the north and the Central Coast Bioregion to the south. The Bay Area/Delta Bioregion is one of the most populous areas of the State, encompassing the San Francisco Bay Area and the Sacramento-San Joaquin River Delta. The water that flows through the Delta supplies two-thirds of California's drinking water, irrigating farmland, and sustaining fish and wildlife and their habitat. The bioregion fans out from San Francisco Bay in a jagged semi-circle that takes in all or part of 12 counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, and parts of Sacramento and Yolo. The habitats and vegetation of the Bay Area/Delta Bioregion are as varied as the geography.

CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM

The California Wildlife Habitat Relationship (CWHR) habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly-occurring birds, mammals, reptiles and amphibians. When first published in 1988, the classification scheme had 53 habitats. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

According to the California Wildlife Habitat Relationship System there are 13 cover types (wildlife habitat classifications) in the Specific Plan Area out of 59 found in the State. These include: AGS – Annual Grassland, BAR – Barren, CRP – Cropland, DOR – Deciduous Orchard, DGR – Dryland Grain Crops, EOR - Evergreen Orchard, IGR – Irrigated Grain Crops, IRH – Irrigated Hayfield, IRF – Irrigated Row and Field Crop, PAS – Pasture, URB – Urban, VIN – Vineyard, and VRI – Valley Foothill Riparian. Table 5.2-1 identifies the total area by acreage for each cover type (wildlife habitat classification) found in the entire

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Specific Plan Area. Figure 5.2-1 illustrates the location of each cover type (wildlife habitat classification) within the entire Specific Plan Area. A brief description of each cover type follows. It should be noted that this area is greater than the total area provided for the Specific Plan Area's assessed land uses (as provided in Chapter 1.0 of this document), since nearly all of the area contained by State Route 4 (SR-4) highway right-of-way is not included in the calculation of total Specific Plan Area assessed land uses (see Figure 1.1-2 for a comparison).

TABLE 5.2-1: COVER TYPES - CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM

<i>COVER TYPE</i>	<i>ACRES WITHIN SPECIFIC PLAN AREA</i>
AGS - Annual Grassland	33.41
BAR - Barren	45.50
CRP - Cropland	47.72
DOR - Deciduous Orchard	35.80
DGR - Dryland Grain Crops	4.15
EOR - Evergreen Orchard	0.22
IGR - Irrigated Grain Crops	5.78
IRH - Irrigated Hayfield	6.23
IRF - Irrigated Row and Field Crops	67.62
PAS - Pasture	23.13
URB - Urban	159.75
VRI - Valley Foothill Riparian	1.08
VIN - Vineyard	0.89
Total	431.27

SOURCE: CASIL GIS DATA, 2016, CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM, 2016.

Developed Cover Types

Cropland includes a variety of sizes, shapes, and growing patterns. Field corn can reach ten feet while strawberries are only a few inches high. Although most crops are planted in rows, alfalfa hay and small grains (rice, barley, and wheat) form dense stands with up to 100 percent canopy closure. Most croplands support annuals, planted in spring and harvested during summer or fall. In many areas, second crops are commonly planted after harvesting the first. Wheat is planted in fall and harvested in late spring or early summer. Overwintering of sugar beets occurs in the Sacramento Valley, with harvesting in spring after the soil dries. Croplands are located on flat to gently rolling terrain. When flat terrain is put into crop production, it usually is leveled to facilitate irrigation. Rolling terrain is either dry farmed or irrigated by sprinklers. Soils often dictate the crops grown. Climate influences the type of crops grown. Within the Specific Plan Area, there are 47.72 acres of cropland habitat.

Deciduous orchards are typically open single species tree dominated habitats. Depending on the tree type and pruning methods they are usually low, bushy trees with an open understory to facilitate harvest. Trees range in height at maturity for many species from 15 to 30 feet, but may be 10 feet or less depending on the species. Crowns usually touch, and are usually in a linear pattern. Spacing between trees is uniform depending on desired spread of mature trees. The understory is usually composed of low-growing grasses, legumes, and other herbaceous plants, but may be managed to prevent understory growth totally or partially, such as along tree rows. Deciduous orchards can be found on flat alluvial soils in the valley floors, in rolling foothill areas, or on relatively steep slopes. Though some deciduous orchards are nonirrigated, most are irrigated. Some flat soils are flood irrigated,

but many deciduous orchards are sprinkler irrigated. Large numbers of orchards are irrigated by drip or trickle irrigation systems. Most deciduous orchards are in valley or foothill areas, with a few, such as, apples and pears, up to 3,000 feet elevation. Within the Specific Plan Area, there are 35.80 acres of deciduous orchard habitat.

Dryland grain crops are typically seed producing grasses, primarily barley, cereal rye, oats, and wheat. These seed and grain crops are annuals. They are usually planted by drilling in rows which produce solid stands, forming 100 percent canopy at maturity in good stands. They are normally planted in fall and harvested in spring. However, they may be planted in rotation with other irrigated crops and winter wheat or barley may be planted after harvest of a previous crop in the fall, dry farmed (during the wet winter and early spring months), and then harvested in late spring. Nonirrigated grain and seed crops are often located on flat to gently rolling terrain. When flat terrain is put into crop production, it usually is leveled to facilitate irrigation. Rolling terrain is either dry farmed or irrigated by sprinklers. Soils often dictate the crops grown. Barley can grow on poor quality soils, such as, saline or alkaline soils. Climate also influences the types of crops grown. Only hardy crops such as potatoes, barley, cereal rye, and wheat do well in the short growing season in the Klamath Basin; whereas, in the Imperial Valley, a variety of crops grow over an eleven month, frost-free growing season. Within the Specific Plan Area, there are 4.15 acres of dryland grain crop habitat.

Evergreen orchards are typically open single species tree dominated habitats. Depending on the tree type and pruning methods they are usually low, bushy trees with an open understory to facilitate harvest. Trees range in height at maturity for many species from 15 to 30 feet, but may be 10 feet or less depending on the species. Crowns often do not touch, and are usually in a linear pattern. Spacing between trees is uniform depending on desired spread of mature trees. The understory is usually composed of low-growing grasses, legumes, and other herbaceous plants, but may be managed to prevent understory growth totally or partially, such as along tree rows. Evergreen orchards can be found on flat alluvial soils in the valley floors, in rolling foothill areas, or on relatively steep slopes. All are irrigated. Some flat soils are flood irrigated, but most evergreen orchards are sprinkler irrigated. Large numbers of orchards are irrigated by drip or trickle irrigation systems. Most evergreen orchards are in valley or foothill areas. Except for olive, most evergreen orchard trees are not very frost tolerant. Within the Specific Plan Area, there are 0.22 acres of evergreen orchard habitat.

Irrigated grain crops are typically a variety of sizes, shapes and growing patterns. Field corn can reach ten feet tall while dry beans are only several inches tall. Most irrigated grain and seed crops are grown in rows. Some may form 100 percent canopy while others may have significant bare areas between rows. All seed and grain crops are annuals. They are usually planted in spring and harvested in summer or fall. However, they may be planted in rotation with other irrigated crops and sometimes winter wheat or barley may be planted after harvest of a previous crop in the fall, dry farmed (during the wet winter and early spring months) or they may be irrigated, and then harvested in the late spring. Irrigated grain and seed crops are located on flat to gently rolling terrain. When flat terrain is put into crop production, it usually is leveled to facilitate irrigation. Rolling terrain is either dry farmed or irrigated by sprinklers. Soils often dictate the crops grown. Within the Specific Plan Area, there are 5.78 acres of irrigated grain crop habitat.

Irrigated hayfield typically includes alfalfa fields and grass hayfields. (Cereal grain fields, whether harvested for hay, grain or straw, should be classified as IGR or DGR.) Alfalfa usually exists unplowed for approximately 3 years or more, followed by a cereal grain crop, vegetables, potatoes or tomatoes for 1-4 years before being planted to alfalfa again. Most hay fields in the warmer parts of California are monocultures of alfalfa. In cooler areas, both alfalfa and introduced grass hay are common and are

regularly irrigated. Occasionally, "native" hay fields are irrigated to enhance their productivity. Native hay fields may include introduced grasses and forbs, but they are managed less intensively and contain a variety of naturally-occurring graminoids and forbs as well. This habitat is found throughout California from below sea level to about 2100 meters (7,000 feet). Within the Specific Plan Area, there are 6.23 acres of irrigated hayfield habitat.

Irrigated row and field crops include a variety of sizes, shapes and growing patterns. Cotton and asparagus can be three or four feet tall while others may be a foot or less high. Most irrigated row and field crops are grown in rows. Some may form 100 percent canopy while others may have significant bare areas between rows. Most are annuals, while others, such as asparagus and strawberries are perennial. The annuals are usually planted in spring and harvested in summer or fall. However, they may be planted in rotation with other irrigated crops and sometimes winter wheat or barley may be planted after harvest of a previous crop in the fall, dry farmed (during the wet winter and early spring months), and then harvested in the late spring. In some areas of southern California three crops may be grown in a year. Row and field crops are located on flat to gently rolling terrain. When flat terrain is put into crop production, it usually is leveled to facilitate irrigation. Rolling terrain usually irrigated by sprinklers. Within the Specific Plan Area, there are 67.62 acres of irrigated row and field crop habitat.

Urban habitats are not limited to any particular physical setting. Three urban categories relevant to wildlife are distinguished: downtown, urban residential, and suburbia. The heavily-developed downtown is usually at the center, followed by concentric zones of urban residential and suburbs. There is a progression outward of decreasing development and increasing vegetative cover. Species richness and diversity is extremely low in the inner cover. The structure of urban vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. A distinguishing feature of the urban wildlife habitat is the mixture of native and exotic species. Within the Specific Plan Area, there are 159.75 acres of urban habitat.

Vineyards are composed of single species planted in rows, usually supported on wood and wire trellises. Vines are normally intertwined in the rows but open between rows. Rows under the vines are usually sprayed with herbicides to prevent growth of herbaceous plants. Between rows of vines, grasses and other herbaceous plants may be planted or allowed to grow as a cover crop to control erosion. Vineyards can be found on flat alluvial soils in the valley floors, in rolling foothill areas, or on relatively steep slopes. All are irrigated. Most vineyards are sprinkler irrigated. Large numbers of vineyards are irrigated by drip or trickle irrigation systems. Most vineyards are in valley or foothill areas. Within the Specific Plan Area, there are 0.89 acres of vineyard habitat.

Herbaceous Cover Types

Annual Grassland habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost-free season averages 250 to 300 days. Annual precipitation is highest in northern California. Within the Specific Plan Area, there are 33.41 acres of annual grassland habitat.

Pastures are planted on flat and gently rolling terrain. Flat terrain is irrigated by the border and check method of irrigation, except on sandy soils or where water supplies are limited. Pastures established on sandy soils or hills are sprinklered. Hilly lands also use wild flooding; that is, ditches that follow the grade along ridges and hillsides, where water is released at selected points along the ditch. Climate influences the length of the growing season. For example, pastures at higher elevations or in the north have a shorter growing season. Within the Specific Plan Area, there are 23.13 acres of pasture habitat.

Hardwood Woodland Cover Types

Valley-foothill riparian habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. The substrate is coarse, gravelly, or rocky soils more or less permanently moist, but probably well aerated. Frost and short periods of freezing occur in winter (200 to 350 frost-free days). This habitat is characterized by hot, dry summers and mild and wet winters. Temperatures range from 75 to 102 F in the summer to 29 to 44 F in the winter. Average precipitation ranges from 6 to 30 inches, with little or no snow. The growing season is 7 to 11 months. Within the Specific Plan Area, there are 1.08 acres of valley-foothill riparian habitat.

Other Habitats

Barren habitat is defined by the absence of vegetation. Any habitat with less than 2% total vegetation cover by herbaceous, desert, or nonwildland species and less than 10% cover by tree or shrub species is defined this way. The physical settings for permanently barren habitat represent extreme environments for vegetation. An extremely hot or cold climate, a near-vertical slope, an impermeable substrate, constant disturbance by either human or natural forces, or a soil either lacking in organic matter or excessively saline can each contribute to a habitat being inhospitable to plants. Within the Specific Plan Area, there are 45.50 acres of barren habitat.

SPECIAL-STATUS SPECIES

The following discussion is based on a background search of special-status species that are documented in the CNDDDB, the California Native Plant Survey (CNPS) Inventory of Rare and Endangered Plants, and the USFWS endangered and threatened species lists. The background search was regional in scope and focused on the documented occurrences within one mile of the Specific Plan Area.

Special Status Plants

Table 5.2-2 provides a list of special-status plant species that are documented within one mile of the Specific Plan Area, their habitat, and current protective status. Figure 5.2-2 illustrates the special status species located within one mile of the Specific Plan Area.

TABLE 5.2-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT

<i>SPECIES</i>	<i>STATUS (FED/STATE/ CNPS)</i>	<i>HABITAT</i>
<i>PLANTS</i>		
<i>Atriplex depressa</i> brittlescale	--/--/1B.2	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, vernal pools. Usually in alkali scalds or alkali clay in meadows or annual grassland; rarely associated w/riparian marshes or vernal pools. 1-320M.
<i>California Macrophylla</i> Round-leaved filaree	--/--/1B.2	Clay, cismontane woodland and valley and foothill grasslands. 15-2000M.
<i>Extriplex joaquinana</i> San Joaquin spearscale	--/--/1B.2	Alkaline. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland. 1-835M.

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<i>SPECIES</i>	<i>STATUS</i> (<i>FED/STATE/</i> <i>CNPS</i>)	<i>HABITAT</i>
<i>Hesperolinon breweri</i> Brewer's western flax	--/--/1B.2	Chaparral, cismontane woodland, valley and foothill grassland. Often in rocky serpentine soil in serpentine chaparral and serpentine grassland. 30-945M.
<i>Madia radiata</i> Showy golden madia	--/--/1B.1	Valley and foothill grassland, cismontane woodland, chenopod scrub. Mostly on adobe clay in grassland or among shrubs. 25-1125M.
<i>Oenothera deltooides ssp. howellii</i> Antioch Dunes evening-primrose	FE/CE/1B.1	Inland dunes. Remnant river bluffs and sand dunes east of Antioch. 0-30M.

SOURCE: CDFW CNDDDB 2016.

NOTES: STATUS IS SHOWN FOR (FEDERAL, STATE, CNPS). (--) INDICATES NO LISTING STATUS.

ABBREVIATIONS:

FE FEDERAL ENDANGERED

CE CALIFORNIA ENDANGERED

1B CNPS - RARE, THREATENED, OR ENDANGERED

- 0.1-SERIOUSLY THREATENED IN CALIFORNIA (OVER 80% OF OCCURRENCES THREATENED / HIGH DEGREE AND IMMEDIACY OF THREAT)

- 0.2-MODERATELY THREATENED IN CALIFORNIA (20-80% OCCURRENCES THREATENED / MODERATE DEGREE AND IMMEDIACY OF THREAT)

- 0.3-NOT VERY THREATENED IN CALIFORNIA (LESS THAN 20% OF OCCURRENCES THREATENED / LOW DEGREE AND IMMEDIACY OF THREAT OR NO CURRENT THREATS KNOWN)

2 CNPS - RARE, THREATENED, OR ENDANGERED IN CALIFORNIA, BUT MORE COMMON ELSEWHERE

Special Status Animals

The search revealed documented occurrences of five special status animal species within one mile of the Specific Plan Area. This includes: one amphibian, three birds and one mammal. Table 5.2-3 provides a list of the special-status animal species that are documented within one miles of the Specific Plan Area, their habitat, and current protective status. Figures 5.2-2 illustrates the location of each documented occurrence.

TABLE 5.2-3: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT

<i>SPECIES</i>	<i>STATUS</i> (<i>FED/STATE</i>)	<i>HABITAT</i>
<i>AMPHIBIANS</i>		
<i>Ambystoma californiense</i> California tiger salamander	FT/CT	Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.
<i>BIRDS</i>		
<i>Athene cuniculari</i> Burrowing owl	--/SSC	Open, treeless areas in dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
<i>Buteo swainsoni</i> Swainson's hawk	--/CT	Swainson's Hawk breeding habitat includes shrub-steppe areas with scattered trees, large shrubs and riparian areas. They will often feed in agricultural areas. Areas they inhabit require at least small tracks of adjacent land containing lightly irrigated agricultural areas particularly with alfalfa and grass hay (their preferred habitat), or non-agricultural areas with low or moderate height vegetated areas

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SPECIES	STATUS (FED/STATE)	HABITAT
<i>Elanus leucurus</i> White-tailed kite	--/CP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated dense-topped trees for nesting and perching.
<i>MAMMALS</i>		
<i>Taxidea taxus</i> American badger	--/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need sufficient food, friable soils and open, uncultivated ground. Prey on burrowing rodents. Dig burrows.

SOURCE: CDFW CNDDDB 2016.

NOTES: STATUS IS SHOWN FOR (FEDERAL, STATE). (--) INDICATES NO LISTING STATUS.

ABBREVIATIONS:

FT FEDERAL THREATENED

CT CALIFORNIA THREATENED

CP CALIFORNIA FULLY PROTECTED UNDER §3511, 4700, 5050 AND 5515 FG CODE

SSC CDFW SPECIES OF SPECIAL CONCERN

Sensitive Natural Communities

The CDFW considers sensitive natural communities to have significant biotic value, with species of plants and animals unique to each community. The CNDDDB search revealed that there is potential for a sensitive environmental occurrence for the Alameda Whipsnake within one mile, to the west of the Specific Plan Area. There are no sensitive natural communities located within one mile of the Specific Plan Area. Figure 5.2-2 illustrates the location of documented special-status species located within one mile of the Specific Plan Area. Figure 5.2-3 documents each sensitive natural community and sensitive environmental occurrence within 10 miles of the Specific Plan Area.

BURROWING OWL AND SWAINSON'S HAWK

The Specific Plan Area includes potential habitat for the western burrowing owl (*Athene cunicularia*) and Swainson's Hawk (*Buteo swainsoni*). The State of California lists the western burrowing owl as a 'bird species of special concern (BSSC) – first priority', and Swainson's Hawk as 'State listed as threatened'. As shown in Figure 5.2-2, the CDFW's CNDDDB contains up to four occurrences of western burrowing owl within the Specific Plan Area. The burrowing owl is a small, long-legged owl found in open landscapes throughout the Americas. Additionally, a Swainson's hawk nesting location was also identified just to the south of the Specific Plan Area. Swainson's Hawks are long distance migrants, wintering in South American and travelling the North America mainly in the spring and summer. Swainson's Hawks build their nests in trees, shrubs, or on the edge of cliffs.

Prior to the issuance of grading or construction permits for any individual projects within the Specific Plan Area, the developer will be required to submit an East Contra Costa County Habitat Conservancy (ECCCHCP) application and associated fee worksheet to the City of Brentwood Community Development Department for review and approval. The developer will be required to pay the applicable ECCCHCP per-acre fee in effect for Zone I in compliance with Section 16.168.070 of the Brentwood Municipal Code. The developer will then receive a Certificate of Coverage from the City of Brentwood and submit a construction monitoring report to the ECCCHCP for review and approval. The Certificate of Coverage will confirm the fee has been received, that other ECCCHCP/NCCP requirements have been met or will be performed, and will authorize take of covered species.

Burrowing Owl

In addition, any individual projects within the Specific Plan Area will be required to implement the following actions/requirements, as provided by the ECCCHCP, in light of burrowing owls being documented within the Specific Plan Area:

- Prior to any ground disturbance related to activities covered under the ECCCHCP, a preconstruction survey of the Specific Plan Area will be required. The surveys will establish the presence or absence of western burrowing owl and/or habitat features, and evaluate use by owls in accordance with CDFW survey guidelines.¹ In addition, a USFWS/CDFW-approved biologist will be required to survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. All burrows or burrowing owls will be identified and mapped. During the breeding season (February 1-August 31), surveys shall document whether burrowing owls are nesting on or directly adjacent to disturbance areas. During the non-breeding season (September 1-January 31), surveys shall document whether burrowing owls are using habitat on or directly adjacent to any disturbance area.
- If burrowing owls are found during the breeding season (February 1-August 31), the project proponent will be required to avoid all nest sites that could be disturbed by project construction during the remainder of the breeding season, or while the nest is occupied by adults or young. Avoidance shall include establishment of a 250-foot non-disturbance buffer zone. Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation, or that the juveniles from the occupied burrows have fledged. During the non-breeding season (September 1-January 31), the project proponent shall avoid the owls and the burrows they are using, if possible. Avoidance shall include the establishment of a 160-foot non-disturbance buffer zone.
- If occupied burrows for burrowing owls are not avoided, passive relocation will be implemented. Owls will be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors shall be in place for 48 hours prior to excavation. The project area shall be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible, burrows shall be excavated using hand tools and refilled to prevent re-occupation.² Plastic tubing or a similar structure shall be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.

Swainson's Hawk

Any individual projects within the Specific Plan Area will be required to comply with the following requirements as provided by the ECCCHCP, in light of Swainson's Hawks being documented near to the Specific Plan Area:

- Prior to any ground disturbance related to activities covered under the ECCCHCP, which are conducted during the nesting season (March 15- September 15), a USFWS/CDFW-approved biologist shall conduct a preconstruction survey no more than 30 days prior to construction in order to establish whether occupied Swainson's hawk nests are located within 1,000 feet of the project site. If potentially occupied nests are identified within 1,000 feet of the project site, then their occupancy will be determined by observation from public roads or by observations of

¹ California Burrowing Owl Consortium. Burrowing Owl Survey Protocol and Mitigation Guidelines. April 1993.

² California Department of Fish and Game. Staff Report on Burrowing Owl Mitigation. March 7, 2012. It should be noted the California Department of Fish and Game is now the California Department of Fish and Wildlife.

Swainson's hawk activity (e.g. foraging) near the project site. A written summary of the survey results shall be submitted to the City of Brentwood Community Development Department. If occupied nests occur on-site or within 1,000 feet of the project site, then the following mitigation shall be implemented. If occupied nests are not found, further mitigation is not necessary.

- During the nesting season (March 15-September 15), covered activities within 1,000 feet of occupied nests or nests under construction shall be prohibited to prevent nest abandonment. If site-specific conditions, or the nature of the covered activity (e.g., steep topography, dense vegetation, and limited activities) indicate that a smaller buffer could be used, the ECCC Habitat Conservancy may coordinate with CDFW/USFWS to determine the appropriate buffer size. If young fledge prior to September 15, covered activities could proceed normally. If the active nest site is shielded from view and noise from the project site by other development, topography, or other features, the project applicant can apply to the ECCC Habitat Conservancy for a waiver of this avoidance measure. Any waiver must also be approved by USFWS and CDFW. While a nest is occupied, activities outside the buffer can take place. All active nest trees will be preserved on site, if feasible. Nest trees, including non-native trees, lost to covered activities will be mitigated by the project proponent according to the requirements below.
- The loss of non-riparian Swainson's hawk nest trees will be mitigated by the project proponent by: if feasible on-site, planting 15 saplings for every tree lost with the objective of having at least 5 mature trees established for every tree lost according to the requirements listed below, and inclusion of at least one of the two following options:
 - Pay the Implementing Entity an additional fee to purchase, plant, maintain, and monitor 15 saplings on the HCP/NCCP Preserve System for every tree lost according to the requirements listed below, OR
 - The project proponent will plant, maintain, and monitor 15 saplings for every tree lost at a site to be approved by the Implementing Entity (e.g., within an HCP/NCCP Preserve or existing open space linked to HCP/NCCP preserves), according to the requirements listed below.

SALMON AND STEELHEAD TROUT FISHERIES

Salmon and steelhead trout are anadromous fish species that are present in the Bay Delta and San Joaquin and Sacramento River Basins. Anadromous fish are born in freshwater rivers and streams, and then migrate to the Pacific Ocean to grow and mature before returning to their place of origin to spawn. The San Joaquin and Sacramento River system produces most of the Chinook salmon (*Oncorhynchus tshawytscha*) and a large percentage of the steelhead trout (*Oncorhynchus mykiss*) in California.

Anadromous fish resources once flourished naturally in the San Joaquin and Sacramento River system, but as a result of habitat destruction from water storage/diversion projects, flood control, mining, sedimentation, and bank degradation, they are protected species under the Federal Endangered Species Act. The San Joaquin and Sacramento River system has historically supported steelhead trout and four distinct spawning runs of Chinook salmon: fall, late fall, winter, and spring. The salmon runs have declined since the late 1800s and are now characterized as episodic. The Central Valley steelhead was Federally listed as threatened in 2003. The fall/late fall-run salmon is a Federal and State species of concern, and a candidate species for Federal listing. The spring-run Chinook salmon population is listed as threatened by both Federal and State agencies. Winter-run Chinook salmon population is listed as a Federally and State endangered species. Populations of Central Valley Steelhead and Chinook salmon

are supported by natural spawning grounds and hatcheries within the San Joaquin and Sacramento River Basin.

Water remaining behind the dams by the start of the spawning run in October is often warmed by summer heat. Warm water and low water elevation are harmful to most coldwater anadromous fish species. Riparian vegetation is critical for the maintenance of high quality fish habitat. It provides cover, controls temperature, stabilizes stream banks, provides food, and buffers streams from erosion and impacts of adjacent land uses. Riparian vegetation also affects stream depth, current velocity, and substrate composition. The decline of riparian communities in California is a factor contributing to the loss of high quality fish habitat.

Marsh Creek Fishery

Chinook salmon and steelhead have lost more than 90% of their historical range in California due to fish passage barriers. In the City of Brentwood, Marsh Creek and its tributaries (Sand Creek, Deer Creek, and Dry Creek) historically provided spawning habitat for Chinook salmon and steelhead; however, several modifications to Marsh Creek, which occurred in the late 1950s and early 1960s for flood control purposes, have resulted in fish passage barriers. The flood control projects included a grade-control drop structure and a flood-control dam, both of which impeded fish passage along Marsh Creek. In addition to the impediments, mercury pollution due to mine tailings at the upstream end of Marsh Creek has caused elevated mercury levels within Marsh Creek and Marsh Creek Reservoir. It should be noted that Marsh Creek is not located within or adjacent to the Specific Plan Area, and therefore is not affected by the Specific Plan Area. However, Sand Creek (a tributary of Marsh Creek) runs along the southern boundary of the Specific Plan Area.

Chinook salmon had been observed spawning in the lower reaches of Marsh Creek below the impediments typically as part of the late fall-winter run of salmon; and juveniles that hatch would remain in Marsh Creek through about April, and then move to the Delta before setting course to the Pacific Ocean. The upper reaches were inaccessible after the installation of the impediments in the late 1950s even though upper reaches were historical spawning grounds and were known to provide ideal salmon spawning habitat and protection for juveniles as they develop.

In December 2010, a fish ladder was constructed at the grade-control drop structure located near the Brentwood Wastewater Treatment Plant. This fish ladder made fish passage at the drop structure possible for the first time since the late 1950s, enabling Chinook salmon and steelhead to utilize the next seven miles of stream channel, up to the fish passage barrier at Marsh Creek Dam. This fish ladder also enabled fish passage into the Marsh Creek tributaries Sand Creek and Deer Creek.

In December 2012, Chinook salmon were documented for the first time above the fish ladder between Balfour Road and Central Boulevard. The fish ladder will enable an ongoing population of Chinook salmon in Marsh Creek and its tributaries (potentially including Sand Creek) up to the barrier at Marsh Creek Dam. Additionally, with time, steelhead are expected to populate these same reaches as they did before the construction of the fish barriers in the late 1950s.

Sand Creek

Sand Creek is an un-channelized tributary of Marsh Creek that travels primarily west to east along the slope of Mount Diablo before flowing into Marsh Creek. A segment of Sand Creek runs along the eastern half of the southern boundary of the Specific Plan Area. Scattered riparian habitat exists along Sand Creek. Recent observations of perennial pools in the upper reach of Sand Creek in Black Diamond Mines

Regional Preserve suggest that removal of the existing migration barriers on Sand Creek might open up suitable habitat for steelhead trout (Cain, Robins & Beamish, 2003). Rural and Urban Acreage land uses are proposed within the Specific Plan Area adjacent to Sand Creek, the construction and operation of which will be required to comply with all applicable laws and regulations, so as not to disturb existing Sand Creek habitat.

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5.3 AIR QUALITY AND GREENHOUSE GASES

This section discusses the regulatory setting, regional climate, topography, air pollution potential, and existing ambient air quality for criteria air pollutants, toxic air contaminants, odors, and dust. Information presented in this section is based in part on information gathered from the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (CARB).

Greenhouse Gases and Climate Change Linkages

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring greenhouse gases include water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and ozone (O₃). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, solely a product of industrial activities. Although the direct greenhouse gases CO₂, CH₄, and N₂O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2011, concentrations of these three greenhouse gases have increased globally by 40, 150, and 20 percent, respectively (IPCC 2013).

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), ozone (O₃), water vapor, nitrous oxide (N₂O), and chlorofluorocarbons (CFCs).

Human-caused emissions of these GHGs, in excess of natural ambient concentrations, are responsible for enhancing the greenhouse effect (Ahrens 2003). 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 2006). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (California Energy Commission 2006).

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. In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (California Energy Commission 2014).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO₂ in the world. California produced 459 million gross metric tons of carbon dioxide equivalents (MMTCO₂e) in 2012 (California Energy Commission 2014). By 2020, California is projected to produce 509 MMTCO₂e per year (California Air Resources Board 2015).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse

effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted.

Effects of Global Climate Change

The effects of increasing global temperature are far-reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs are anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. The snowpack portion of the supply could potentially decline by 70% to 90% by the end of the 21st century (Cal EPA 2006). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels (Cal EPA 2006). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands (Cal EPA 2006). As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. Under the emissions scenarios of the Climate Scenarios report (Cal EPA 2006), the impacts of global warming in California are anticipated to include, but are not limited to, the following.

PUBLIC HEALTH. Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25 to 35 percent under the lower warming range, to 75 to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

WATER RESOURCES. A vast network of man-made reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months.

Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major state fresh water supply. Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25 percent of the water supply they need; decrease the potential for hydropower production within the state (although the effects on hydropower are uncertain); and seriously harm winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as 1 month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snow pack by as much as 70 to 90 percent. Under the lower warming scenario, snow pack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snow pack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

AGRICULTURE. Increased GHG emissions are expected to cause widespread changes to the agriculture industry, reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development will change, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding seasons, and increase pathogen growth rates.

FORESTS AND LANDSCAPES. Global warming is expected to intensify this threat by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the

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state. For example, if precipitation increases as temperatures rise, wildfires in southern California are expected to increase by approximately 30 percent toward the end of the century. In contrast, precipitation decreases could increase wildfires in northern California by up to 90 percent.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the state. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests is also expected to decrease as a result of global warming.

RISING SEA LEVELS. Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the state's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

REGULATORY SETTING

Air quality with respect to criteria air pollutants and toxic air contaminants (TACs) within the San Francisco Bay Area Air Basin (SFBAAB) is regulated by such agencies as the BAAQMD, CARB, and Federal EPA. Each of these agencies develops rules, regulations, policies, and/or goals to attain the goals or directives imposed through legislation. Although the EPA regulations may not be superseded, both State and local regulations may be more stringent.

FEDERAL

U.S. Environmental Protection Agency

At the Federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required EPA to establish primary and secondary national ambient air quality standards (NAAQS). The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The Federal Clean Air Act Amendments of 1990 (FCAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformity to the mandates of the FCAAA and determine if implementation will achieve air quality goals. If the EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Federal Hazardous Air Pollutant Program

Title III of the FCAA requires the EPA to promulgate national emissions standards for hazardous air pollutants (NESHAPs). The NESHAP may differ for major sources than for area sources of HAPs (major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources). The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), the EPA

developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum available control technology (MACT). These Federal rules are also commonly referred to as MACT standards, because they reflect the Maximum Achievable Control Technology. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards. The FCAAA required the EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, §219 required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions.

Federal Climate Change Policy

According to the EPA, “the United States government has established a comprehensive policy to address climate change” that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, “the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science.” The Federal government’s goal is to reduce the greenhouse gas (GHG) intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including “ENERGY STAR,” “Climate Leaders,” and Methane Voluntary Programs. However, as of this writing, there are no adopted Federal plans, policies, regulations, or laws directly regulating GHG emissions.

Energy Policy Act of 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a Federal purchase requirement for renewable energy.

STATE

In 1992 and 1993, the California Air Resources Board (CARB) requested delegation of authority for the implementation and enforcement of specified New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPS) to the following local agencies: Bay Area and South Coast Air Quality Management Districts (AQMDs). EPA's review of the State of California's laws, rules, and regulations showed them to be adequate for the implementation and enforcement of these Federal standards, and EPA granted the delegations as requested.

California Air Resources Board

CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), which was adopted in 1988. The CCAA requires that all air districts in the State endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources.

5.0 CONSERVATION AND NATURAL RESOURCES

CARB is primarily responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. CARB is primarily responsible for statewide pollution sources and produces a major part of the SIP. Local air districts are still relied upon to provide additional strategies for sources under their jurisdiction. The CARB combines this data and submits the completed SIP to EPA.

Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which in many cases are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

Transport of Pollutants

The California Clean Air Act, Section 39610 (a), directs the CARB to “identify each district in which transported air pollutants from upwind areas outside the district cause or contribute to a violation of the ozone standard and to identify the district of origin of transported pollutants.” The information regarding the transport of air pollutants from one basin to another was to be quantified to assist interrelated basins in the preparation of plans for the attainment of State ambient air quality standards. Numerous studies conducted by the CARB have identified air basins that are impacted by pollutants transported from other air basins (as of 1993). Among the air basins affected by air pollution transport from the SFBAAB are the North Central Coast Air Basin, the Mountain Counties Air Basin, the San Joaquin Valley Air Basin, and the Sacramento Valley Air Basin. The SFBAAB was also identified as an area impacted by the transport of air pollutants from the Sacramento region.

State Toxic Air Contaminant Programs

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified over 21 TACs, and adopted the EPA’s list of HAPs as TACs. Most recently, diesel exhaust particulate was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate best available control technology (BACT) to minimize emissions. None of the TACs identified by CARB have a safe threshold.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level:

1. Prepare a toxic emission inventory;
2. Prepare a risk assessment if emissions are significant;
3. Notify the public of significant risk levels; and
4. Prepare and implement risk reduction measures.

CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors and generators). In February 2000, CARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for: 1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines, 2) zero-emission bus demonstration and purchase requirements applicable to transit agencies, and 3) reporting

requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially less TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, and diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures [e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

Assembly Bill 1493

In response to AB 1493, CARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California's existing motor vehicle emission standards. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961), and adoption of Section 1961.1 (CCR 13 1961.1), require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016. For passenger cars and light-duty trucks 3,750 pounds or less loaded vehicle weight (LVW), the 2016 GHG emission limits are approximately 37 percent lower than during the first year of the regulations in 2009. For medium-duty passenger vehicles and light-duty trucks 3,751 LVW to 8,500 pounds gross vehicle weight (GVW), GHG emissions are reduced approximately 24 percent between 2009 and 2016.

CARB requested a waiver of Federal preemption of California's Greenhouse Gas Emissions Standards. The intent of the waiver is to allow California to enact emissions standards to reduce carbon dioxide and other greenhouse gas emissions from automobiles in accordance with the regulation amendments to the CCRs that fulfill the requirements of AB 1493. The EPA granted a waiver to California to implement its greenhouse gas emissions standards for cars.

California Executive Orders S-3-05 and S-20-06, and Assembly Bill 32

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by 2020 and 3) 80% below 1990 levels by 2050.

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs State agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

Assembly Bill 1007

Assembly Bill 1007 (Pavley, Chapter 371, Statutes of 2005) directed the CEC to prepare a plan to increase the use of alternative fuels in California. As a result, the CEC prepared the State Alternative Fuels Plan in consultation with State, Federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that

minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality

Governor's Low Carbon Fuel Standard (Executive Order S-01-07)

Executive Order S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard is incorporated into the State Alternative Fuels Plan and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32.

Assembly Bill 32- Climate Change Scoping Plan

On December 11, 2008 ARB adopted its *Climate Change Scoping Plan* (Scoping Plan), which functions as a roadmap of ARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. The Scoping Plan contains the main strategies California will implement to reduce CO₂e emissions by 169 million metric tons (MMT), or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO₂e under a business-as-usual scenario. (This is a reduction of 42 MMT CO₂e, or almost 10 percent, from 2002–2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.) The Scoping Plan also breaks down the amount of GHG emissions reductions ARB recommends for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO₂e),
- the Low-Carbon Fuel Standard (15.0 MMT CO₂e),
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO₂e), and
- a renewable portfolio standard for electricity production (21.3 MMT CO₂e).

Climate Action Program at Caltrans

Caltrans prepared a Climate Action Program in response to new regulatory directives. The goal of the Climate Action Program is to promote clean and energy efficient transportation, and provide guidance for mainstreaming energy and climate change issues into business operations. The overall approach to lower fuel consumption and CO₂ from transportation is twofold: (1) reduce congestion and improve efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems; and (2) institutionalize energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

The reasoning underlying the Climate Action Program is the conclusion that "the most effective approach to addressing GHG reduction, in the short-to-medium term, is strong technology policy and market mechanisms to encourage innovations. Rapid development and availability of alternative fuels and vehicles, increased efficiency in new cars and trucks (light and heavy duty), and super clean fuels are

the most direct approach to reducing GHG emissions from motor vehicles (emission performance standards and fuel or carbon performance standards).”

Bioenergy Action Plan – Executive Order #S-06-06

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity.

Senate Bill 97

Senate Bill 97 (Chapter 185, 2007) required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. OPR prepared its recommended amendments to the State CEQA Guidelines to provide guidance to public agencies regarding the analysis and mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions in draft CEQA documents. The Amendments became effective on March 18, 2010.

Senate Bill 375

SB 375 requires CARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. The 18 metropolitan planning organizations (MPO) in California will prepare a "sustainable communities strategy" to reduce the amount of greenhouse gas emission in their respective regions and demonstrate the ability for the region to attain CARB's reduction targets. CARB would later determine if each region is on track to meet their reduction targets. In addition, cities would have extra time -- eight years instead of five -- to update housing plans required by the State.

LOCAL

Bay Area Air Quality Management District

The BAAQMD attains and maintains air quality conditions in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the FCAA, FCAAA, and the CCAA.

The BAAQMD has regulated TACs since the 1980s. At the local level, air pollution control or management districts may adopt and enforce CARB's control measures. Under BAAQMD Regulation 2-1 (General Permit Requirements), Regulation 2-2 (New Source Review), and Regulation 2-5 (New Source Review), all nonexempt sources that possess the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The BAAQMD limits emissions and public exposure to TACs through a number of programs.

5.0 CONSERVATION AND NATURAL RESOURCES

The BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. In addition, the BAAQMD has adopted Regulation 11 Rules 2 and 14, which address asbestos demolition renovation, manufacturing, and standards for asbestos containing serpentine.

BAAQMD Air Quality Plans

As stated above, the BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB. The BAAQMD prepares ozone attainment plans (OAP) for the national ozone standard and clean air plans (CAP) for the California standard both in coordination with the Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG).

With respect to applicable air quality plans, the BAAQMD prepared the 2010 Clean Air Plan to address nonattainment of the national 1-hour ozone standard in the SFBAAB. The purpose of the 2010 Clean Air Plan is to:

1. Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement “all feasible measures” to reduce ozone;
2. Consider the impacts of ozone control measures on particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan;
3. Review progress in improving air quality in recent years;
4. Establish emission control measures to be adopted or implemented in the 2009-2012 timeframe; and
5. Address nonattainment of the CAAQS.

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following policies related to air quality:

Conservation and Open Space Element

GOAL COS-8: Reduce air pollutants and greenhouse gas (GHG) emissions.

POLICY COS 8-1: Improve air quality through continuing to require a development pattern that focuses growth in and around existing urbanized areas, locating new housing near places of employment, encouraging alternative modes of transportation, and requiring projects to mitigate significant air quality impacts.

POLICY COS 8-2: Minimize exposure of sensitive receptors to concentrations of air pollutant emissions and toxic air contaminants.

POLICY COS 8-3: Require discretionary projects involving sensitive receptors such as children, the elderly, or people with illnesses that are proposed within 500 feet of the State Route 4 corridor to include an analysis of mobile source toxic air contaminant health risks. The analysis, if necessary, shall identify feasible mitigation measures to reduce health risks to acceptable levels.

POLICY COS 8-4: Encourage new development or significant remodels to install fireplaces, wood stoves, and/or heaters which meet Bay Area Air Quality Management District (BAAQMD) standards.

POLICY COS 8-5: Continue to require all construction projects and ground disturbing activities to implement BAAQMD dust control and abatement measures.

POLICY COS 8-6: Support the development and implementation of a GHG reduction plan, or Climate Action Plan, that addresses and reduces GHG emissions associated with community operations, including but not limited to, mobile sources (vehicle traffic), energy consumption, and solid waste.

POLICY COS 8-7: Coordinate with Contra Costa County and nearby cities to implement regional GHG reduction plans and consolidate efforts to reduce GHGs throughout the county.

POLICY COS 8-8: Encourage local businesses and industries to engage in voluntary efforts to reduce GHG emissions and energy consumption.

POLICY COS 8-9: Preserve, protect, and enhance, as appropriate, the City's carbon sequestration resources, also referred to as "carbon sinks," to improve air quality and reduce net carbon emissions.

POLICY COS 8-10: Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.

POLICY COS 8-11: Encourage new construction to incorporate passive solar features.

ACTION COS 8a: Review all new industrial and commercial development projects for potential air quality impacts to residences and other sensitive receptors. The City shall ensure that mitigation measures and best management practices are implemented to reduce significant emissions of criteria pollutants.

ACTION COS 8b: Review development, infrastructure, and planning projects for consistency with BAAQMD requirements during the CEQA review process. Require project applicants to prepare air quality analyses to address BAAQMD and General Plan requirements, which include analysis and identification of:

1. Air pollutant emissions associated with the project during construction, project operation, and cumulative conditions;
2. Potential exposure of sensitive receptors to toxic air contaminants;
3. Significant air quality impacts associated with the project for construction, project operation, and cumulative conditions; and
4. Mitigation measures to reduce significant impacts to less than significant or the maximum extent feasible where impacts cannot be mitigated to less than significant.

ACTION COS 8c: Prepare and adopt a Climate Action Plan. The Climate Action Plan should include the following components:

1. A baseline greenhouse gas (GHG) emissions inventory;
2. An adopted GHG emissions reduction target of at least 15% below the business-as-usual projections by 2020;
3. GHG reductions measures that apply to community wide operations, City operations, and future development projects; and

4. An implementation and monitoring program.

ACTION COS 8d: Work with Contra Costa County and the Bay Area Air Quality Management District to implement programs aimed at improving regional air quality.

ACTION COS 8e: Adequate buffers between new industrial uses and sensitive receptors shall be required to avoid potential air quality and nuisance impacts.

ACTION COS 8f: Provide a conservation page (or similar page) on the City’s website that provides links to resource agencies (i.e., CARB, BAAWMD, EPA, etc.) and provides information regarding local and regional conservation and environmental programs, to the extent that the City has readily available information, including methods for pollution prevention such as reduced air pollutant and greenhouse gas emissions through use of alternative forms of transportation (i.e., bicycling, pedestrian, transit), through reducing wood-burning activities using EPA-certified wood-burning devices, etc.

GOAL COS-9: Promote conservation of energy and other natural resources

POLICY COS 9-1: Require all new public and privately constructed buildings to meet and comply with the most current “green” development standards in the California Code of Regulations (CCR), Title 24.

POLICY COS 9-2: Support innovative and green building best management practices including, but not limited to, LEED certification for all new development, and encourage project applicants to exceed the most current “green” development standards in the California Code of Regulations (CCR), Title 24, if feasible.

POLICY COS 9-3: Promote the use of alternative energy sources in new development.

POLICY COS 9-4: Incorporate innovative green building techniques and best management practices in the site design, construction, and renovation of all public projects.

POLICY COS 9-10: Ensure that the layout and design of new development and significant remodels encourages the use of transportation modes other than automobiles and trucks.

POLICY COS 9-13: Continue to encourage and support the use of bicycles as an alternative means of transportation.

ENVIRONMENTAL SETTING – AIR QUALITY

San Francisco Bay Area Air Basin

Brentwood is located within the San Francisco Bay Area Air Basin (SFBAAB), which comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, the southern portion of Sonoma County, and the southwestern portion of Solano County. Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions. These factors along with applicable regulations are discussed below.

CLIMATE, TOPOGRAPHY, AND AIR POLLUTION POTENTIAL

The SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns.

The climate is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell. During the summer, the Pacific high pressure cell is centered over the northeastern portion of the Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface because of the northwesterly flow produces a band of cold water off the California coast. The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold water band resulting in condensation and the presence of fog and stratus clouds along the Northern California coast.

In the winter, the Pacific high-pressure cell weakens and shifts southward resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in a low air pollution potential.

High Pressure Cell

During the summer, the large-scale meteorological condition that dominates the West Coast is a semi-permanent high pressure cell centered over the northeastern portion of the Pacific Ocean. This high pressure cell keeps storms from affecting the California coast. Hence, the SFBAAB experiences little precipitation in the summer months. Winds tend to blow on shore out of the north/northwest.

The steady northwesterly flow induces upwelling of cold water from below. This upwelling produces a band of cold water off the California coast. When air approaches the California coast, already cool and moisture-laden from its long journey over the Pacific, it is further cooled as it crosses this bank of cold water. This cooling often produces condensation resulting in a high incidence of fog and stratus clouds along the Northern California coast in the summer.

Generally in the winter, the Pacific high pressure cell weakens and shifts southward, winds tend to flow offshore, upwelling ceases, and storms occur. During the winter rainy periods, inversions (layers of warmer air over colder air; see below) are weak or nonexistent, winds are usually moderate, and air pollution potential is low. The Pacific high pressure cell does periodically become dominant, bringing strong inversions, light winds, and high pollution potential.

Topography

The topography of the SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays. This complex terrain, especially the higher elevations, distorts the normal wind flow patterns in the SFBAAB. The greatest distortion occurs when low-level inversions are present and the air beneath the inversion flows independently of air above the inversion, a condition that is common in the summer time.

The only major break in California's Coast Range occurs in the SFBAAB. Here the Coast Range splits into western and eastern ranges. Between the two ranges lies San Francisco Bay. The gap in the western coast range is known as the Golden Gate, and the gap in the eastern coast range is the Carquinez Strait. These gaps allow air to pass into and out of the SFBAAB and the Central Valley.

Wind Patterns

During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more directly from the west as they stream

through the Golden Gate. This channeling of wind through the Golden Gate produces a jet that sweeps eastward and splits off to the northwest toward Richmond and to the southwest toward San Jose when it meets the East Bay hills.

Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait, the Golden Gate, or the San Bruno gap. For example, the average wind speed at San Francisco International Airport in July is about 17 knots (from 3 p.m. to 4 p.m.), compared with only 7 knots at San Jose and less than 6 knots at the Farallon Islands.

The air flowing in from the coast to the Central Valley, called the sea breeze, begins developing at or near ground level along the coast in late morning or early afternoon. As the day progresses, the sea breeze layer deepens and increases in velocity while spreading inland. The depth of the sea breeze depends in large part upon the height and strength of the inversion. If the inversion is low and strong, and hence stable, the flow of the sea breeze will be inhibited and stagnant conditions are likely to result.

In the winter, the SFBAAB frequently experiences stormy conditions with moderate to strong winds, as well as periods of stagnation with very light winds. Winter stagnation episodes are characterized by nighttime drainage flows in coastal valleys. Drainage is a reversal of the usual daytime air-flow patterns; air moves from the Central Valley toward the coast and back down toward the Bay from the smaller valleys within the SFBAAB.

Temperature

Summertime temperatures in the SFBAAB are determined in large part by the effect of differential heating between land and water surfaces. Because land tends to heat up and cool off more quickly than water, a large-scale gradient (differential) in temperature is often created between the coast and the Central Valley, and small-scale local gradients are often produced along the shorelines of the ocean and bays. The temperature gradient near the ocean is also exaggerated, especially in summer, because of the upwelling of cold ocean bottom water along the coast. On summer afternoons the temperatures at the coast can be 35°F cooler than temperatures 15 to 20 miles inland. At night this contrast usually decreases to less than 10°.

In the winter, the relationship of minimum and maximum temperatures is reversed. During the daytime the temperature contrast between the coast and inland areas is small, whereas at night the variation in temperature is large.

Precipitation

The SFBAAB is characterized by moderately wet winters and dry summers. Winter rains account for about 75 percent of the average annual rainfall. The amount of annual precipitation can vary greatly from one part of the SFBAAB to another even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys.

During rainy periods, ventilation (rapid horizontal movement of air and injection of cleaner air) and vertical mixing are usually high, and thus pollution levels tend to be low. However, frequent dry periods do occur during the winter where mixing and ventilation are low and pollutant levels build up.

Air Pollution Potential

The potential for high pollutant concentrations developing at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the contaminated air. The topographic and climatological factors discussed above influence the atmospheric pollution potential of an area. Atmospheric pollution potential, as the term is used here, is independent of the location of emission sources and is instead a function of factors described below.

Wind Circulation

Low wind speed contributes to the buildup of air pollution because it allows more pollutants to be emitted into the air mass per unit of time. Light winds occur most frequently during periods of low sun (fall and winter, and early morning) and at night. These are also periods when air pollutant emissions from some sources are at their peak, namely, commute traffic (early morning) and wood burning appliances (nighttime). The problem can be compounded in valleys, when weak flows carry the pollutants upvalley during the day, and cold air drainage flows move the air mass downvalley at night. Such restricted movement of trapped air provides little opportunity for ventilation and leads to buildup of pollutants to potentially unhealthful levels.

Inversions

An inversion is a layer of warmer air over a layer of cooler air. Inversions affect air quality conditions significantly because they influence the mixing depth (i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground). The highest air pollutant concentrations in the SFBAAB generally occur during inversions.

There are two types of inversions that occur regularly in the SFBAAB. One is more common in the summer and fall, while the other is most common during the winter. The frequent occurrence of elevated temperature inversions in summer and fall months acts to cap the mixing depth, limiting the depth of air available for dilution. Elevated inversions are caused by subsiding air from the subtropical high pressure zone, and from the cool marine air layer that is drawn into the SFBAAB by the heated low pressure region in the Central Valley.

The inversions typical of winter, called radiation inversions, are formed as heat quickly radiates from the earth's surface after sunset, causing the air in contact with it to rapidly cool. Radiation inversions are strongest on clear, low-wind, cold winter nights, allowing the build-up of such pollutants as carbon monoxide and particulate matter. When wind speeds are low, there is little mechanical turbulence to mix the air, resulting in a layer of warm air over a layer of cooler air next to the ground. Mixing depths under these conditions can be as shallow as 50 to 100 meters, particularly in rural areas. Urban areas usually have deeper minimum mixing layers because of heat island effects and increased surface roughness. During radiation inversions, downwind transport is slow, the mixing depths are shallow, and turbulence is minimal, all factors which contribute to ozone formation.

Although each type of inversion is most common during a specific season, either inversion mechanism can occur at any time of the year. Sometimes both occur simultaneously. Moreover, the characteristics of an inversion often change throughout the course of a day. The terrain of the SFBAAB also induces significant variations among subregions.

Solar Radiation

The frequency of hot, sunny days during the summer months in the SFBAAB is another important factor that affects air pollution potential. It is at the higher temperatures that ozone is formed. In the presence of ultraviolet sunlight and warm temperatures, reactive organic gases and oxides of nitrogen react to

form secondary photochemical pollutants, including ozone. Because temperatures in many of the SFBAAB inland valleys are so much higher than near the coast, the inland areas are especially prone to photochemical air pollution.

In late fall and winter, solar angles are low, resulting in insufficient ultraviolet light and warming of the atmosphere to drive the photochemical reactions. Ozone concentrations do not reach significant levels in the SFBAAB during these seasons.

Sheltered Terrain

The hills and mountains in the SFBAAB contribute to the high pollution potential of some areas. During the day, or at night during windy conditions, areas in the lee sides of mountains are sheltered from the prevailing winds, thereby reducing turbulence and downwind transport. At night, when wind speeds are low, the upper atmospheric layers are often decoupled from the surface layers during radiation conditions. If elevated terrain is present, it will tend to block pollutant transport in that direction. Elevated terrain also can create a recirculation pattern by inducing upvalley air flows during the day and reverse downvalley flows during the night, allowing little inflow of fresh air.

The areas having the highest air pollution potential tend to be those that experience the highest temperatures in the summer and the lowest temperatures in the winter. The coastal areas are exposed to the prevailing marine air, creating cooler temperatures in the summer, warmer temperatures in winter, and stratus clouds all year. The inland valleys are sheltered from the marine air and experience hotter summers and colder winters. Thus, the topography of the inland valleys creates conditions conducive to high air pollution potential.

Pollution Potential Related to Emissions

Although air pollution potential is strongly influenced by climate and topography, the air pollution that occurs in a location also depends upon the amount of air pollutant emissions in the surrounding area or transported from more distant places. Air pollutant emissions generally are highest in areas that have high population densities, high motor vehicle use, and/or industrialization. These contaminants created by photochemical processes in the atmosphere, such as ozone, may result in high concentrations many miles downwind from the sources of their precursor chemicals.

Carquinez Strait Climatological Subregion

There are 11 climatological subregions within the SFBAAB. Brentwood is located within the Carquinez Strait subregion. The Carquinez Strait runs from Rodeo to Martinez. It is the only sea-level gap between the Bay and the Central Valley. The subregion includes the lowlands bordering the strait to the north and south, and includes the area adjoining Suisun Bay and the western part of the Sacramento-San Joaquin Delta as far east as Bethel Island. The subregion extends from Rodeo in the southwest and Vallejo in the northwest to Fairfield on the northeast and Brentwood on the southeast.

Prevailing winds are from the west in the Carquinez Strait. During the summer and fall months, high pressure offshore coupled with low pressure in the Central Valley causes marine air to flow eastward through the Carquinez Strait. The wind is strongest in the afternoon. Afternoon wind speeds of 15 to 20 mph are common throughout the subregion. Annual average wind speeds are 8 mph in Martinez, and 9 to 10 mph further east. Sometimes atmospheric conditions cause air to flow from the east. East winds usually contain more pollutants than the cleaner marine air from the west. In the summer and fall months, this can cause elevated pollutant levels to move into the central SFBAAB through the strait. These high pressure periods are usually accompanied by low wind speeds, shallow mixing depths, higher temperatures, and little or no rainfall.

Summer mean maximum temperatures reach about 90F in the subregion. Mean minimum temperatures in the winter are in the high 30's. Temperature extremes are especially pronounced in sheltered areas farther from the moderating effects of the strait itself (e.g., in Fairfield).

Many industrial facilities with significant air pollutant emissions — e.g., chemical plants and refineries — are located within the Carquinez Strait subregion. The pollution potential of this area is often moderated by high wind speeds. However, upsets at industrial facilities can lead to short-term pollution episodes, and emissions of unpleasant odors may occur at any time. Receptors downwind of these facilities could suffer more long-term exposure to air contaminants than individuals elsewhere. It is important that local governments and other lead agencies maintain buffer zones around sources of air pollution sufficient to avoid adverse health and nuisance impacts on nearby receptors. Areas of the subregion that are traversed by major roadways (e.g., Interstate 80), may also be subject to higher local concentrations of carbon monoxide and particulate matter, as well as certain toxic air contaminants such as benzene.

EXISTING AMBIENT AIR QUALITY: CRITERIA AIR POLLUTANTS

The California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) currently focus on the following air pollutants as indicators of ambient air quality: ozone (O₃), particulate matter (PM), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), and lead (Pb). Because these are the most prevalent air pollutants known to be deleterious to human health, they are commonly referred to as “criteria air pollutants.” Sources and health effects of the criteria air pollutants are summarized in Table 5.3-1.

TABLE 5.3-1 COMMON SOURCES OF HEALTH EFFECTS FOR CRITERIA AIR POLLUTANTS

<i>POLLUTANTS</i>	<i>SOURCES</i>	<i>HEALTH EFFECTS</i>
Ozone (O ₃)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases; reduced lung function; increased cough and chest discomfort
Fine Particulate Matter (PM ₁₀ and PM _{2.5})	Stationary combustion of solid fuels; construction activities; industrial processes; atmospheric chemical reactions	Reduced lung function; aggravation of respiratory and cardiovascular diseases; increases in mortality rate; reduced lung function growth in children
Nitrogen Dioxide (NO ₂)	Motor vehicle exhaust; high temperature stationary combustion; atmospheric reactions	Aggravation of respiratory illness
Carbon Monoxide (CO)	Incomplete combustion of fuels and other carbon-containing substances, such as motor vehicle exhaust; natural events, such as decomposition of organic matter	Aggravation of some heart diseases; reduced tolerance for exercise; impairment of mental function; birth defects; death at high levels of exposure
Sulfur Dioxide (SO ₂)	Combination of sulfur-containing fossil fuels; smelting of sulfur-bearing metal ore; industrial processes	Aggravation of respiratory diseases; reduced lung function
Lead (Pb)	Contaminated soil	Behavioral and hearing disabilities in children; nervous system impairment

SOURCE: BAY AREA AIR QUALITY MANAGEMENT DISTRICT (2012)

Ozone (O₃), or smog, is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between reactive organic gases (ROG) and nitrous oxide (NOX) in the presence of sunlight. Ozone formation is greatest on warm, windless, sunny days. The main sources of NOX and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines), the evaporation of solvents, paints, and fuels, and biogenic sources. Automobiles are the single largest source of ozone precursors in the SFBAAB. Tailpipe emissions of ROG are highest during cold starts, hard acceleration, stop-and-go conditions, and slow speeds. They decline as speeds increase up to about 50 mph, then increase again at high speeds and high engine loads. ROG emissions associated with evaporation of unburned fuel depend on vehicle and ambient temperature cycles. Nitrogen oxide emissions exhibit a different curve; emissions decrease as the vehicle approaches 30 mph and then begin to increase with increasing speeds.

Ozone levels usually build up during the day and peak in the afternoon hours. Short-term exposure can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, it can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Chronic exposure to high ozone levels can permanently damage lung tissue. Ozone can also damage plants and trees, and materials such as rubber and fabrics.

Particulate Matter (PM) refers to a wide range of solid or liquid particles in the atmosphere, including smoke, dust, aerosols, and metallic oxides. Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM₁₀. PM_{2.5} includes a subgroup of finer particles that have an aerodynamic diameter of 2.5 micrometers or less. Some particulate matter, such as pollen, is naturally occurring. In the SFBAAB most particulate matter is caused by combustion, factories, construction, grading, demolition, agricultural activities, and motor vehicles. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. PM₁₀ is of concern because it bypasses the body's natural filtration system more easily than larger particles, and can lodge deep in the lungs. The EPA and the State of California revised their PM standards several years ago to apply only to these fine particles. PM_{2.5} poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health. Motor vehicles are currently responsible for about half of particulates in the SFBAAB. Wood burning in fireplaces and stoves is another large source of fine particulates.

Nitrogen Dioxide (NO₂) is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO₂. Aside from its contribution to ozone formation, nitrogen dioxide can increase the risk of acute and chronic respiratory disease and reduce visibility. NO₂ may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Carbon Monoxide (CO) is an odorless, colorless gas. It is formed by the incomplete combustion of fuels. The single largest source of CO in the SFBAAB is motor vehicles. Emissions are highest during cold starts, hard acceleration, stop-and-go driving, and when a vehicle is moving at low speeds. New findings indicate that CO emissions per mile are lowest at about 45 mph for the average light-duty motor vehicle and begin to increase again at higher speeds. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death.

Sulfur Dioxide (SO₂) is a colorless acid gas with a pungent odor. It has potential to damage materials and it can have health effects at high concentrations. It is produced by the combustion of sulfur-containing fuels, such as oil, coal, and diesel. SO₂ can irritate lung tissue and increase the risk of acute and chronic respiratory disease.

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the EPA’s regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Ambient Air Quality Standards and Designations

The current Federal and State ambient air quality standards and attainment standards are presented in Table 5.3-2 (BAAQMD, 2014a).

TABLE 5.3-2 AMBIENT AIR QUALITY STANDARDS AND DESIGNATIONS

POLLUTANT	AVERAGING TIME	CALIFORNIA		NATIONAL STANDARDS ^A		
		STANDARDS ^{B,C}	ATTAINMENT STATUS ^D	PRIMARY ^{C,E}	SECONDARY ^{C,F}	ATTAINMENT STATUS ^G
Ozone	1-hour	0.09 ppm (180 µg/m ³)	N (Serious)	–h	Same as Primary Standard	–h
	8-hour	0.070 ppm (137 µg/m ³)	N	0.070 ppm		N
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m ³)	A	35 ppm (40 mg/m ³)	–	A
	8-hour	9 ppm (10 mg/m ³)		9 ppm (10 mg/m ³)		
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	–	0.053 ppm (100 µg/m ³)	Same as Primary Standard	A
	1-hour	0.18 ppm (339 µg/m ³)	A	0.100 ppm		U
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m ³)	–	A
	24-hour	0.04 ppm (105 µg/m ³)	A	0.14 ppm (365 µg/m ³)	–	
	1-hour	0.25 ppm (655 µg/m ³)	A	0.075 ppm (196 µg/m ³)	–	

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POLLUTANT	AVERAGING TIME	CALIFORNIA		NATIONAL STANDARDS ^A		
		STANDARDS ^{B,C}	ATTAINMENT STATUS ^D	PRIMARY ^{C,E}	SECONDARY ^{C,F}	ATTAINMENT STATUS ^G
Respirable Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	N	- h	Same as Primary Standard	-h
	24-hour	50 µg/m ³		150 µg/m ³		U
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	N	12 µg/m ³	Same as Primary Standard	U/A
	24-hour	-	-	35 µg/m ³		N
Lead	30-day Average	1.5 µg/m ³	-	-	-	A
	Calendar Quarter	-	-	1.5 µg/m ³	Same as Primary Standard	A
Sulfates	24-hour	25 µg/m ³	A	No National Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)	U			
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m ³)	-			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer — visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

a National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM₁₀ 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The PM_{2.5} 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current Federal policies.

b California standards for ozone, CO (except Lake Tahoe), SO₂ (1- and 24-hour), NO₂, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

c Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter (µg/m³)]. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.

Attainment (A): a pollutant is designated attainment if the State standard for that pollutant was not violated at any site in the area during a 3-year period.

Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a State standard for that pollutant in the area.

Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

e National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

f National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse

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POLLUTANT	AVERAGING TIME	CALIFORNIA		NATIONAL STANDARDS ^A		
		STANDARDS ^{B,C}	ATTAINMENT STATUS ^D	PRIMARY ^{C,E}	SECONDARY ^{C,F}	ATTAINMENT STATUS ^G
effects of a pollutant.						
g Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.						
Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.						
Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.						
h The 1-hour ozone NAAQS was revoked on June 15, 2005 and the annual PM10 NAAQS was revoked in 2006.						
i ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for this pollutant.						
j U.S. EPA lowered the 24-hour PM2.5 standard from 65 µg/m ³ to 35 µg/m ³ in 2006. EPA issued attainment status designations for the 35 µg/m ³ standard on December 22, 2008. EPA has designated the Bay Area as nonattainment for the 35 µg/m ³ PM2.5 standard. The EPA designation will be effective 90 days after publication of the regulation in the Federal Register.						

SOURCE: BAY AREA AIR QUALITY MANAGEMENT DISTRICT (2014)

Monitoring Data

The BAAQMD operates a regional air quality monitoring network that regularly measures the concentrations of the major criteria air pollutants. Air pollutant monitoring data is available at <http://www.arb.ca.gov/adam/welcome.html>. Air quality conditions in the SFBAAB have improved significantly since the BAAQMD was created in 1955. Ambient concentrations and the number of days on which the region exceeds standards have declined dramatically. Neither Federal nor State ambient air quality standards have been violated in recent decades for nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and vinyl chloride.

The closest air quality monitoring site to Brentwood is located in Bethel Island, approximately five miles to the northeast. This monitoring site measures ozone and PM₁₀ only. The next closest monitoring site is located in Concord. This site measures ozone, PM₁₀, and PM_{2.5}. It is important to note that the Federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for Federal standards. Data obtained from the monitoring sites between 2013 and 2015 is shown in Tables 5.3-3 and 5.3-4.

TABLE 5.3-3: AMBIENT AIR QUALITY MONITORING DATA (BETHEL ISLAND ROAD)

POLLUTANT	CAL.	FED.	YEAR	DAYS EXCEEDED STATE/FED STANDARD
	PRIMARY STANDARD			
Ozone (O ₃) (1-hour)	0.09 ppm for 1 hour	NA	2013	0 / (N/A)
			2014	0 / (N/A)
			2015	0 / (N/A)
Ozone (O ₃) (8-hour)	0.07 ppm for 8 hour	0.07 ppm for 8 hour	2013	1 / 1
			2014	1 / 1
			2015	2 / 1
Particulate Matter (PM ₁₀)	50 ug/m ³ for 24 hours	150 ug/m ³ for 24 hours	2013	* / *
			2014	* / 0
			2015	* / 0
Fine Particulate Matter (PM _{2.5})	No 24 hour State Standard	35 ug/33 for 24 hours	Not collected at this site.	

NOTES:

PPM = PARTS PER MILLION.

UG/M³ = MICRONS PER CUBIC METER.

NA = NOT APPLICABLE

* = THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE

SOURCE: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2013-2015.

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TABLE 5.3-4: AMBIENT AIR QUALITY MONITORING DATA (CONCORD-2975 TREAT BLVD)

POLLUTANT	CAL.	FED.	YEAR	DAYS EXCEEDED STATE/FED STANDARD
	PRIMARY STANDARD			
Ozone (O ₃) (1-hour)	0.09 ppm for 1 hour	NA	2013 2014 2015	0 / (N/A) 1 / (N/A) 0 / (N/A)
Ozone (O ₃) (8-hour)	0.07 ppm for 8 hour	0.070 ppm for 8 hour	2013 2014 2015	0 / 0 2 / 2 4 / 2
Particulate Matter (PM ₁₀)	50 ug/m ³ for 24 hours	150 ug/m ³ for 24 hours	2013 2014 2015	* / 0 * / 0 * / 0
Particulate Matter (PM _{2.5})	No 24 hour State Standard	35 ug/m ³ for 24 hours	2013 2014 2015	(N/A) / 1 (N/A) / 0 (N/A) / 0

NOTES:

PPM = PARTS PER MILLION.

UG/M³ = MICRONS PER CUBIC METER.

NA= NOT APPLICABLE

* = THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE

SOURCE: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2013-2015.

Emissions Inventory

The BAAQMD estimates emissions of criteria air pollutants from approximately 900 source categories. The estimates are based on BAAQMD permit information for stationary sources (e.g., manufacturing industries, refineries, and dry-cleaning operations), plus more generalized estimates for area sources (e.g., space heating, landscaping activities, and use of consumer products) and mobile sources (e.g., trains, ships and planes, as well as on-road and off-road motor vehicles). BAAQMD emissions inventory data is available at <http://www.arb.ca.gov/app/emsinv/emssumcat.php>. Table 5.3-5 presents the 2015 estimated annual emissions in Contra Costa County.

TABLE 5.3-5 2015 ESTIMATED ANNUAL AVERAGE EMISSIONS (CONTRA COSTA COUNTY)

STATIONARY SOURCES	TOG	ROG	CO	NOX	SOX	PM	PM ₁₀	PM _{2.5}
Fuel Combustion	5.1	1.9	14.5	19.6	10.6	3.3	3.2	3.2
Waste Disposal	43.3	1.1	0.1	0.2	0.0	0.0	0.0	0.0
Cleaning and Surface Coatings	4.2	3.4	0.0	0.0	-	-	-	-
Petroleum Production and Marketing	43.2	11.8	0.2	0.7	9.5	1.2	0.7	0.7
Industrial Processes	3.8	3.2	1.3	2.5	7.8	2.6	1.8	1.1
Total Stationary Sources	99.7	21.4	16.2	23.0	28.0	7.1	5.8	5.0
AREAWIDE SOURCES	TOG	ROG	CO	NOX	SOX	PM	PM ₁₀	PM _{2.5}
Solvent Evaporation	11.9	10.6	-	-	-	-	-	-
Miscellaneous Processes	16.4	3.5	45.0	2.8	0.1	53.5	29.1	10.2
Total Areawide Sources	28.4	14.2	45.0	2.8	0.1	53.5	29.1	10.2
MOBILE SOURCES	TOG	ROG	CO	NOX	SOX	PM	PM ₁₀	PM _{2.5}
On-road Motor Vehicles	11.8	10.8	97.6	17.9	0.2	1.5	1.5	1.0
Other Mobile Sources	9.4	8.7	67.7	21.1	8.1	1.6	1.5	1.4
Total Mobile Sources	21.2	19.5	165.3	39.0	8.2	3.1	3.0	2.4
TOTAL FOR CONTRA COSTA COUNTY	149.2	55.1	226.6	64.9	36.3	63.7	37.9	17.5

SOURCE: CALIFORNIA AIR RESOURCES BOARD ALMANAC EMISSION PROJECTION DATA 2015 ESTIMATED ANNUAL AVERAGE EMISSIONS

EXISTING AMBIENT AIR QUALITY: TOXIC AIR CONTAMINANTS

In addition to the criteria air pollutants listed above, another group of pollutants, commonly referred to as toxic air contaminants (TACs) or hazardous air pollutants can result in health effects that can be quite severe. Many TACs are confirmed or suspected carcinogens, or are known or suspected to cause birth defects or neurological damage. Secondly, many TACs can be toxic at very low concentrations. For some chemicals, such as carcinogens, there are no thresholds below which exposure can be considered risk-free.

It is important to understand that TACs are not considered criteria air pollutants and thus are not specifically addressed through the setting of ambient air quality standards. Instead, the EPA and CARB regulate hazardous air pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by the BAAQMD establish the regulatory framework for TACs.

Industrial facilities and mobile sources are significant sources of TACs. The electronics industry, including semiconductor manufacturing, has the potential to contaminate both air and water due to the highly toxic chlorinated solvents commonly used in semiconductor production processes. Sources of TACs go beyond industry. Various common urban facilities also produce TAC emissions, such as gasoline stations (benzene), hospitals (ethylene oxide), and dry cleaners (perchloroethylene). Automobile exhaust also contains TACs such as benzene and 1,3-butadiene. Diesel particulate matter has also been identified as a TAC by the CARB. Diesel PM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. BAAQMD research indicates that mobile-source emissions of diesel PM, benzene, and 1,3-butadiene represent a substantial portion of the ambient background risk from TACs in the SFBAAB.

The BAAQMD operates a Community Air Risk Evaluation (CARE) program, which estimates and reports both local and regional impacts of TACs in the Bay Area. No portion of the Specific Plan Area is categorized as an ‘impacted community’ by the BAAQMD under this program (BAAQMD, 2014b). However, the BAAQMD provides an inventory of sites and sources of TACs that exceed the BAAQMD’s TAC ‘Chronic Trigger Level’, which represents a level that the BAAQMD views as requiring additional screening and/or emissions limitations (see BAAQMD Regulation 2-5, Table 2-5-1 Chronic Trigger Level for further detail). The most recent inventory lists eleven sources of TACs in Brentwood, two of which are located within or adjacent to the Specific Plan Area (BAAQMD, 2014c):

- Home Depot located at 5631 Lone Tree Way (located within the northern half of the Specific Plan Area);
- City of Brentwood facility located at Heidorn Ranch Road (1400 feet south of Lone Tree Way) (located within the western boundary of the Specific Plan Area).

The pollutant of concern at both of these facilities is diesel PM. The Home Depot located at 5631 Lone Tree Way is an existing business that is not located near to any existing or planned residence or sensitive receptor. However, the City of Brentwood facility located at Heidorn Ranch Road (1400 feet south of Lone Tree Way) (identified by the Specific Plan Area assessed land use of “Government Owned, with or without buildings” in Figure 1.1-2 of this document) is located approximately 200 feet to the north of a planned single-family residential community (at its closest point). TAC screening may be required for the residential community planned at this location.

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In addition, SR-4, a segment of which is located within the Specific Plan Area, has the potential to generate substantial TACs on existing or planned sensitive receptors within the Specific Plan Area. The ARB Air Quality and Land Use Handbook: A Community Health Perspective (CARB, 2005), recommends that new sensitive land uses should not be placed within 500 feet of a freeway. However, there are no assessed land uses that contain sensitive receptors proposed within the Specific Plan Area that would be located within 500 feet of SR-4 (see Figure 1.1-2 of this document for detail).

EXISTING AMBIENT AIR QUALITY: ODORS AND DUST

Other air quality issues of concern in the SFBAAB include nuisance impacts of odors and dust. Objectionable odors may be associated with a variety of pollutants. Common sources of odors include wastewater treatment plants, landfills, composting facilities, refineries and chemical plants. Similarly, nuisance dust may be generated by a variety of sources including quarries, agriculture, grading and construction. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to anger and concern over possible health effects among the public. Each year the BAAQMD receives thousands of citizen complaints about objectionable odors. Dust emissions can contribute to increased ambient concentrations of PM₁₀, and can also contribute to reduced visibility and soiling of exposed surfaces.

Potential existing sources of objectionable odors within the Specific Plan Area include a service station/car wash located within the northwest, and other commercial/shopping center uses located within the northwest and northeast of the Specific Plan Area. However, while the potential for these uses to generate objectionable odors exists, these land uses are not known to be major sources objectionable odors or dust. Land uses surrounding the Specific Plan Area consist of residential, shopping center, school, and church uses, which are not generally known to cause objectionable odor or dust concerns.

Future planned land uses within the Specific Plan Area include agricultural, residential, and government-owned uses. The Specific Plan Area residential and government-owned uses, which would be located within the northern half of the Specific Plan Area, are not expected to generate objectionable odors and/or dust. Additionally, the agricultural uses, which would consist of orchard/vineyard/row crops, are not expected to contribute to significant objectionable odors. However, the likelihood of objectionable odors depends on the particular practices employed within this land use (e.g. the use of pesticides and/or fertilizer), which could cause odor complaints to nearby existing and planned residential land uses. In addition, there is the potential for significant quantities of dust to be generated by this land use, depending on the farming practices employed. Dust and odor generated from within the Specific Plan Area agricultural land uses could impact nearby existing and planned residential communities, and therefore would be subject to further analysis.

EXISTING GREENHOUSE GAS EMISSIONS IN BRENTWOOD

City of Brentwood Community-Wide GHG Emissions

Community-wide GHG emissions (existing and projected) for the City of Brentwood were calculated in the City of Brentwood General Plan Environmental Impact Report (2014). The California Emission Estimator Model (CalEEMod)™ (v.2013.2.2) was used to estimate community-wide operational GHG emissions associated with existing conditions (as of 2014), full buildout of the General Plan within the city limits, and full buildout of the General Plan within the Brentwood Planning Area.

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GHG emissions generated by buildout of the General Plan Land Use Map within the city limits and the Planning Area would consist primarily of CO₂ emissions, with very limited quantities of methane (CH₄) also generated. Carbon dioxide equivalents (CO₂e) provide a universal standard of measurement against which the impacts of releasing (or avoiding the release of) different greenhouse gases can be evaluated. Every greenhouse gas has a Global Warming Potential (GWP), a measurement of the impact that particular gas has on 'radiative forcing'; that is, the additional heat/energy which is retained in the Earth's ecosystem through the addition of this gas to the atmosphere.

Table 5.3-6 shows the CO₂e emissions, which include mobile source, area source, and energy emissions that would result from operations under existing conditions within Brentwood. Tables 5.3-7 and 5.3-8 show CO₂e emissions associated with buildout of the General Plan within the city limits and the Planning Area, respectively. These estimates are considered a “worst-case” scenario, and do not account for additional GHG emissions reductions that may be achieved following adoption and implementation of a local climate action plan. The full calculations, inputs, and assumptions are provided within the City of Brentwood General Plan EIR.

TABLE 5.3-6: YEAR 2014 COMMUNITY-WIDE GHG EMISSIONS

<i>EMISSIONS CATEGORY</i>	<i>UNMITIGATED CO₂E (METRIC TONS)</i>	<i>MITIGATED CO₂E (METRIC TONS)</i>
Area Source GHG Emissions	3,281.0	1,421.0
Energy Source GHG Emissions	113,053.2	111,917.1
Mobile Source GHG Emissions	365,936.8	365,936.8
Waste Source GHG Emissions	26,806.5	26,806.5
Water Source GHG Emissions	7,617.8	6,359.7
Total	516,695.3	512,441.2

SOURCE: CITY OF BRENTWOOD GENERAL PLAN EIR, PG. 3.7-16.

TABLE 5.3-7: COMMUNITY-WIDE GHG EMISSIONS UPON BUILDING WITHIN CITY LIMITS

<i>EMISSIONS CATEGORY</i>	<i>UNMITIGATED CO₂E (METRIC TONS)</i>	<i>MITIGATED CO₂E (METRIC TONS)</i>
Area Source GHG Emissions	1,220.6	631.4
Energy Source GHG Emissions	72,451.9	71,951.3
Mobile Source GHG Emissions	274,339.6	274,339.6
Waste Source GHG Emissions	9,109.5	9,109.5
Water Source GHG Emissions	6,660.2	5,458.6
Total	363,781.9	361,490.3

SOURCE: CITY OF BRENTWOOD GENERAL PLAN EIR, PG. 3.7-16.

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TABLE 5.3-8: COMMUNITY-WIDE GHG EMISSIONS WITHIN THE BUILDOUT PLANNING AREA

<i>EMISSIONS CATEGORY</i>	<i>UNMITIGATED CO₂E (METRIC TONS)</i>	<i>MITIGATED CO₂E (METRIC TONS)</i>
Area Source GHG Emissions	1,889.9	921.1
Energy Source GHG Emissions	98,994.5	98,259.4
Mobile Source GHG Emissions	369,984.9	369,984.9
Waste Source GHG Emissions	12,440.2	12,440.2
Water Source GHG Emissions	8,772.6	7,189.3
Total	492,082.2	488,794.8

SOURCE: CITY OF BRENTWOOD GENERAL PLAN EIR, PG. 3.7-16.

As shown in Table 5.3-6, under existing conditions, all sources within Brentwood generate a combined total of 516,695.3 metric tons of CO₂e per year. Following implementation of the GHG reduction measures contained in the City of Brentwood General Plan, and accounting for a range of statewide legislative actions to reduce GHG emissions, upon full buildout of the General Plan within the city limits, CO₂e emissions are projected to be 361,490.3 metric tons per year, which represents a decrease of approximately 30 percent. This decrease in citywide GHG emissions is consistent with the statewide GHG reduction targets established by AB 32.

As demonstrated by the policies and actions listed below, the Brentwood General Plan has taken a number of steps to reduce GHG emissions through a wide range of measures and programs. The policies and actions listed below are consistent with the policy guidance provided by CAPCOA through the 2009 Model Policies for Greenhouse Gases in General Plans, which is consistent with the AB 32 Scoping Plan, and GHG reduction measures recommended by the BAAQMD. In addition to the policies and actions provided below, the City had already implemented energy efficiency and other GHG reduction strategies prior to the recent General Plan Update. These strategies include the City program that sponsors a low-flow toilet rebate, the operation by the City vehicle fleet of several electric and natural gas vehicles, and the completion of a City civic center building, which incorporates many different energy efficient design practices in order to effectively reduce building energy requirements.

GENERAL PLAN POLICIES AND ACTIONS THAT REDUCE GREENHOUSE GAS EMISSIONS

Policies

POLICY COS 8-1: guidance provided by CAPCOA through the 2009 Model Policies for Greenhouse Gases in General Plans, which is consistent with the AB 32 Scoping Plan, and GHG reduction measures recommended by the BAAQMD.

POLICY COS 8-2: Minimize exposure of sensitive receptors to concentrations of air pollutant emissions and toxic air contaminants.

POLICY COS 8-3: Require discretionary projects involving sensitive receptors such as children, the elderly, or people with illnesses that are proposed within 500 feet of the State Route 4 corridor to include an analysis of mobile source toxic air contaminant health risks. The analysis, if necessary, shall identify feasible mitigation measures to reduce health risks to acceptable levels.

POLICY COS 8-4: Encourage new development or significant remodels to install fireplaces, wood stoves, and/or heaters which meet Bay Area Air Quality Management District (BAAQMD) standards.

POLICY COS 8-5: Continue to require all construction projects and ground disturbing activities to implement BAAQMD dust control and abatement measures.

POLICY COS 8-6: Support the development and implementation of a GHG reduction plan, or Climate Action Plan, that addresses and reduces GHG emissions associated with community operations, including but not limited to, mobile sources (vehicle traffic), energy consumption, and solid waste.

POLICY COS 8-7: Coordinate with Contra Costa County and nearby cities to implement regional GHG reduction plans and consolidate efforts to reduce GHGs throughout the county.

POLICY COS 8-8: Encourage local businesses and industries to engage in voluntary efforts to reduce GHG emissions and energy consumption.

POLICY COS 8-9: Preserve, protect, and enhance, as appropriate, the City's carbon sequestration resources, also referred to as "carbon sinks," to improve air quality and reduce net carbon emissions.

POLICY COS 8-10: Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.

POLICY COS 8-11: Encourage new construction to incorporate passive solar features.

POLICY COS 9-1: Require all new public and privately constructed buildings to meet and comply with the most current "green" development standards in the California Code of Regulations (CCR), Title 24.

POLICY COS 9-2: Support innovative and green building best management practices including, but not limited to, LEED certification for all new development, and encourage project applicants to exceed the most current "green" development standards in the California Code of Regulations (CCR), Title 24, if feasible.

POLICY COS 9-3: Promote the use of alternative energy sources in new development.

Policy COS 9-4: Incorporate innovative green building techniques and best management practices in the site design, construction, and renovation of all public projects.

POLICY COS 9-5: Promote water conservation among water users.

POLICY COS 9-6: Continue to require new development to incorporate water efficient fixtures into design and construction.

POLICY COS 9-7: Promote the use of reclaimed water and other non-potable water sources.

POLICY COS 9-8: Encourage large-scale developments and golf course developments to incorporate dual water systems.

POLICY COS 9-9: Encourage and support the use of drought-tolerant and regionally native plants in landscaping.

POLICY COS 9-10: Ensure that the layout and design of new development and significant remodels encourages the use of transportation modes other than automobiles and trucks.

POLICY COS 9-11: Continue the citywide recycling program and actively encourage recycling.

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POLICY COS 9-12: Continue efforts to reduce solid waste generation throughout the life of the General Plan.

POLICY COS 9-13: Continue to encourage and support the use of bicycles as an alternative means of transportation.

POLICY CIR 1-3: When analyzing impacts to the circulation network created by new development or roadway improvements, consider the needs of all users, including those with disabilities, ensuring that pedestrians, bicyclists, and transit riders are considered at an equal level to automobile drivers.

POLICY CIR 2-1: Establish and maintain a system of interconnected bicycle, pedestrian, and equestrian facilities that facilitate commuter and recreational travel, and that are consistent with the City's parks, trails, and recreation goals and policies in this General Plan and the Contra Costa County Countywide Bicycle and Pedestrian Plan.

POLICY CIR 2-2: Routinely incorporate sidewalks and enhanced pedestrian crossing facilities as part of new street construction, and incorporate bicycle facilities on new collector and arterial streets (including bicycle lanes where appropriate, bicycle route and destination signs, and bicycle detection at signals).

POLICY CIR 2-3: Require development projects to construct on-site sidewalks, paths, and trails in a manner that is consistent with the City's parks, trails, and recreation goals and policies in this General Plan and the Contra Costa County Countywide Bicycle and Pedestrian Plan, and as dictated by the location of transit stops and common pedestrian destinations.

POLICY CIR 2-8: Provide secure bicycle racks in places such as the Downtown, at commercial areas, park and ride transit facilities, schools, multiple unit residential developments, and other locations where there is a concentration of residents, visitors, students, or employees.

POLICY CIR 2-9: Where possible, integrate multi-use path facilities into utility corridor rights-of-way.

POLICY CIR 2-10: Work with utility providers to reduce or eliminate barriers to pedestrian and bicyclist mobility created by utility infrastructure (such as utility poles that obstruct accessibility).

POLICY CIR 2-12: Seek opportunities to fund and construct improvements that improve multimodal access to any future mass transit facility (i.e., eBART).

POLICY CIR 2-13: Coordinate with Tri Delta Transit to increase the coverage areas and frequencies of bus service in Brentwood.

POLICY CIR 2-14: Ensure that effective linkages are in place between any future mass transit facility (i.e., eBART) and the city's primary activity and employment centers.

POLICY CIR 2-15: Coordinate with Tri Delta Transit to maintain existing and, where feasible, build new lighted and sheltered seating facilities at bus stops.

POLICY CIR 2-17: Encourage the use of park-and-ride lots and other transit incentives for Brentwood commuters.

POLICY CIR 2-18: Work with Tri Delta Transit to identify the need for and locations of additional park-and-ride lots in Brentwood in order to increase the number and length of trips made by transit and carpooling.

POLICY CIR 2-19: Provide safe and continuous pedestrian, vehicular, and bicycle access at all transit park-and-ride facilities.

POLICY CIR 3-2: Prioritize high-density and mixed land use patterns that promote transit and pedestrian travel along transit corridors.

POLICY CIR 3-3: Design developments to include features that encourage walking, bicycling, and transit use. Design features shall include bus turnouts, transit shelters and benches, and pedestrian access points between subdivisions and between adjacent related land uses.

Policy CIR 3-9: Design intersections to provide adequate and safe access for all users including pedestrians, bicyclists, and motorists of all ages and abilities.

POLICY CIR 3-10: Require new development to include effective linkages to the surrounding circulation system for all modes of travel, to the extent feasible.

POLICY LU 1-4: Require new development to occur in a logical and orderly manner, focusing growth on infill locations and areas designated for urbanization on the Land Use Map (Figure LU-1), and be subject to the ability to provide urban services, including paying for any needed extension of services.

POLICY LU 1-5: Encourage new development to be contiguous to existing development, whenever possible.

POLICY LU 2-6: Encourage new development that is convenient to bus or future passenger rail transit lines (e.g. eBART service) in order to reduce automobile dependence.

POLICY LU 2-7: Strongly encourage residential development in the city in a balanced and efficient pattern that reduces sprawl, preserves open space, and creates convenient connections to other land uses.

Actions

ACTION COS 8c: Prepare and adopt a Climate Action Plan. The Climate Action Plan should include the following components:

1. A baseline greenhouse gas (GHG) emissions inventory
2. An adopted GHG emissions reduction target at least 15% below the business-as-usual projections by 2020
3. GHG reductions measures that apply to community wide operations, City operations, and future development projects
4. An implementation and monitoring program

ACTION COS 8d: Work with Contra Costa County and the Bay Area Air Quality Management District to implement programs aimed at improving regional air quality.

ACTION COS 8e: Adequate buffers between new industrial uses and sensitive receptors shall be required to avoid potential air quality and nuisance impacts.

ACTION COS 8f: Provide a conservation page (or similar page) on the City's website that provides links to resource agencies (i.e., CARB, BAAQMD, EPA, etc.) and provides information regarding local and regional

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conservation and environmental programs, to the extent that the City has readily available information, including methods for pollution prevention such as reduced air pollutant and greenhouse gas emissions through use of alternative forms of transportation (i.e., bicycling, pedestrian, transit), through reducing wood-burning activities using EPA-certified wood-burning devices, etc.

ACTION COS 9a: Continue to review development projects to ensure that all new public and private development complies with the California Code of Regulations (CCR), Title 24 standards as well as the energy efficiency standards established by the General Plan and the Brentwood Municipal Code.

ACTION COS 9b: Connect residents and businesses with programs that provide free or low-cost energy efficiency audits and retrofits to existing buildings.

ACTION COS 9c: Explore amending the Brentwood Municipal Code to incentivize the use of small-scale renewable energy facilities and, where appropriate, to remove impediments to such uses.

ACTION COS 9d: Develop and provide incentives to developers and businesses that use reclaimed water and other non-potable water for landscaping.

ACTION COS 9e: Continue to implement Chapter 17.630 of the Brentwood Municipal Code, particularly as it relates to water conservation efforts.

ACTION COS 9f: Provide a conservation page (or similar page) on the City's website that provides links to resource agencies and provides information regarding local and regional conservation and environmental programs, to the extent that the City has readily available information, including recycling guidance for single family residences, businesses, and apartments, opportunities for reuse of materials, a description of how to compost, and a description of methods to reduce water use, such as appropriate reuse and recycling of water, water conservation measures, and xeriscaping.

ACTION CIR 2a: Review development applications to ensure compliance with the parks, trails, and recreation goals and policies in this General Plan and the Countywide Bicycle and Pedestrian Plan.

ACTION CIR 2g: Assist and coordinate with Tri Delta Transit in seeking funding to increase transit frequencies on key corridors, increase the hours of transit operation, and expand regular transit service in portions of Brentwood that have no public transit service.

ACTION CIR 2i: Monitor national efforts to establish effective multimodal level of service standards for pedestrian, bicycle, and transit modes.

ACTION CIR 2j: Issue guidelines and incorporate assessment of multimodal LOS as a routine component of transportation impact analyses once the Public Works Department determines a multimodal LOS methodology that is deemed suitable for application in Brentwood.

ACTION CIR 3a: During the development review process, the Community Development Department shall review plans to ensure that projects include an interconnected network of streets and paths that facilitate non-auto modes for shorter trips, and disperse rather than concentrate traffic in residential neighborhoods.

ACTION LU 2e: Locate medium and high density residential development near activity centers, employment centers, and major transportation corridors.

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5.4 GEOLOGY, SOILS, AND SEISMICITY

This section addresses seismic and geologic hazards in the City of Brentwood and the Specific Plan Area.

REGULATORY SETTING

FEDERAL

International Building Code (IBC)

The purpose of the International Building Code (IBC) is to provide minimum standards to preserve the public peace, health, and safety by regulating the design, construction, quality of materials, certain equipment, location, grading, use, occupancy, and maintenance of all buildings and structures. IBC standards address foundation design, shear wall strength, and other structurally related conditions.

STATE

The State of California has established a variety of regulations and requirements related to seismic safety and structural integrity, including the California Building Standards Code, the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazards Mapping Act.

California Building Standards Code

Title 24 of the California Code of Regulations, known as the California Building Standards Code (CBSC) or simply "Title 24," contains the regulations that govern the construction of buildings in California. The CBSC includes 12 parts: California Building Standards Administrative Code, California Building Code, California Residential Building Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Historical Building Code, California Fire Code, California Existing Building Code, California Green Building Standards Code (CALGreen Code), and the California Reference Standards Code. Through the CBSC, the State provides a minimum standard for building design and construction. The CBSC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 sets forth the policies and criteria of the State Mining and Geology Board, which governs the exercise of governments' responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults. The policies and criteria are limited to potential hazards resulting from surface faulting or fault creep within Earthquake Fault Zones, as delineated on maps officially issued by the State Geologist. Working definitions include:

- **Fault** – a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side;
- **Fault Zone** – a zone of related faults, which commonly are braided and sub parallel, but may be branching and divergent. A fault zone has a significant width (with respect to the scale at which the fault is being considered, portrayed, or investigated), ranging from a few feet to several miles;

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- Sufficiently Active Fault – a fault that has evidence of Holocene surface displacement along one or more of its segments or branches (last 11,000 years); and
- Well-Defined Fault – a fault whose trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The geologist should be able to locate the fault in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

“Sufficiently Active” and “Well Defined” are the two criteria used by the State to determine if a fault should be zoned under the Alquist-Priolo Act.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides. Under the Act, seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning. The program and actions mandated by the Seismic Hazards Mapping Act closely resemble those of the Alquist-Priolo Earthquake Fault Zoning Act (which addresses only surface fault-rupture hazards) and are outlined below:

The State Geologist is required to delineate the various “seismic hazard zones.”

- Cities and counties, or other local permitting authority, must regulate certain development “projects” within the zones. They must withhold the development permits for a site within a zone until the geologic and soil conditions of the site are investigated and appropriate mitigation measures, if any, are incorporated into development plans.
- The State Mining and Geology Board provides additional regulations, policies, and criteria to guide cities and counties in their implementation of the law. The Board also provides guidelines for preparation of the Seismic Hazard Zone Maps and for evaluating and mitigating seismic hazards.
- Sellers (and their agents) of real property within a mapped hazard zone must disclose that the property lies within such a zone at the time of sale.

Caltrans Seismic Design Criteria

The California Department of Transportation (Caltrans) has Seismic Design Criteria (SDC), which is an encyclopedia of new and currently practiced seismic design and analysis methodologies for the design of new bridges in California. The SDC adopts a performance-based approach specifying minimum levels of structural system performance, component performance, analysis, and design practices for ordinary standard bridges. The SDC has been developed with input from the Caltrans Offices of Structure Design, Earthquake Engineering and Design Support, and Materials and Foundations. Memo 20-1 Seismic Design Methodology (Caltrans 1999) outlines the bridge category and classification, seismic performance criteria, seismic design philosophy and approach, seismic demands and capacities on structural components, and seismic design practices that collectively make up Caltrans’ seismic design

*LOCAL***City of Brentwood General Plan**

The existing City of Brentwood General Plan identifies the following policies related to geology, soils, and seismicity:

Safety Element**GOAL SA-1 – Protect the Brentwood community from geologic and seismic hazards.**

POLICY SA-1.1 - Regulate development in areas of seismic and geologic hazards to reduce risks to life and property associated with earthquakes, liquefaction, erosion, landslides, and expansive soils.

POLICY SA-1.2 - Where feasible, require new development to avoid unreasonable exposure to geologic hazards, including earthquake damage, subsidence, liquefaction, and expansive soils.

POLICY SA-1.3 - Ensure that all new development and construction is reviewed by the City to ensure conformance with applicable building standards related to geologic and seismic safety.

POLICY SA-1.4 - Require geotechnical investigations to be completed prior to approval of any public safety facilities, such as fire stations, in order to ensure that these critical facilities are constructed in a way that mitigates site-specific seismic and/or geologic hazards.

POLICY SA-1.5 - Ensure that critical facilities in Brentwood's Planning Area are designed and constructed to withstand the "maximum probable" earthquake and remain in service. Critical facilities include police stations, fire stations, hospitals, and other public or semi-public buildings that house critical first-responders or emergency management personnel.

POLICY SA-1.6 - Development in areas subject to liquefaction shall be reviewed by qualified soils engineers and geologists prior to development in order to ensure the safety and stability of all construction (see Figure 5.5-2 in the General Plan Existing Conditions Report).

POLICY SA-1.7 - Prevent land subsidence and maintain adequate groundwater supplies.

POLICY SA-1.8 - Where alterations such as grading and tree or vegetation removal are made to hillside sites, rendering slopes unstable, planting of vegetation or other engineering means shall be encouraged to protect structures at lower elevations.

POLICY SA-1.9 - The use of drought-tolerant plants for landscaping in hillside areas shall be encouraged as a means to eliminate the need for supplemental watering.

POLICY SA-1.10 - An erosion and sediment control plan prepared by a civil engineer, or other professional who is qualified to prepare such a plan, shall be submitted as part of any grading permit application for new development. The erosion and sediment control plan shall delineate measures to appropriately and effectively minimize soil erosion and sedimentation, and shall comply with the design standards and construction site control measures contained in Chapter 15.52 (Grading, Erosion and Sediment Control) of the Brentwood Municipal Code.

POLICY SA-1.11 - All structures and building foundations located within areas containing expansive soils shall be designed and engineered to comply with the most current version of the California Code of Regulations (CCR), Title 24.

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Action SA 1a - Require the submission of geologic and soils reports for all new developments. The geologic risk areas that are determined from these studies shall have standards established and recommendations shall be incorporated into development.

Action SA 1b - All building code requirements shall be adhered to so as to provide for maximum safety requirements. Inspections for compliance shall be made by the Community Development Department prior to approval for occupancy.

Action SA 1c - Require strict adherence to the requirements of the California Code of Regulations (CCR), Title 24 in all areas of the city and, during the development review process, ensure that public and critical use buildings shall not be located in areas susceptible to potential natural hazards.

Action SA 1e - Regularly review the structural integrity of all existing City facilities and, if any facilities are found unsatisfactory, take steps to ensure structural integrity and safety.

Action SA 1f - As part of the development review process, ensure development applications incorporate drainage and erosion standards identified in the Brentwood Municipal Code. Inspections by the Community Development Department and the Public Works Department will ensure compliance.

Action SA 1g - When a change in natural grade or removal of existing vegetation is necessary, appropriate vegetative cover to stabilize slopes and reduce erosion shall be encouraged. This shall be accomplished through the development and design review process.

Action SA 1h - Annually review revisions to the California Code of Regulations (CCR), Title 24 and consider adoption of updates that include new or revised measures to avoid or reduce the potential for damage to structures and facilities caused by seismic and other geologic hazards.

Action SA 1i - As applications for building permits are received, identify and inspect seismically unsafe buildings and structures, including unreinforced masonry buildings.

Action SA 1j - Explore programs and funding sources that would encourage, assist, or provide incentives to property owners to retrofit their buildings for seismic safety, such as the Unreinforced Masonry (URM) program.

Action SA 1k - Monitor withdrawal of groundwater, oil, and gas, maintain land elevation records, and regulate overdraft to prevent subsidence.

Action SA 1l - Regulate abandoned wells and the removal of abandoned underground irrigation and drainage systems.

Action SA 1m - Maintain an inventory of all natural hazards, including active faults, Alquist-Priolo Special Study Zones, floodplains, and projected dam failure inundation areas.

ENVIRONMENTAL SETTING

The City of Brentwood is located in eastern Contra Costa County, approximately 50 miles east of San Francisco and 50 miles southwest of Sacramento. Brentwood is situated in the western portion of the San Joaquin Valley, immediately east of the Diablo Range which forms the eastern boundary of the Coast Ranges.

The topography of the Specific Plan Area is characterized by the relatively flat terrain typical of the Central Valley, with a few gently sloping hills in the southern and western portions of the Specific Plan Area near the foothills of the Diablo Range. Elevations in Brentwood range from 25 feet above mean sea level (MSL) in the northeast portion of the city to 492 feet above MSL at the highest peak in the southwest portion of the city.

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 Brentwood. Marsh Creek is the largest of the waterways within Brentwood. Sand Creek, Deer Creek, and Dry Creek flow into Marsh Creek. 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 Brentwood, and extends north to the Creek's confluence with the San Joaquin River located in the city of Oakley.

Geomorphic Province

California's geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform. Earth scientists recognize eleven provinces in California. Each region displays unique, defining features based on geology, faults, topographic relief, and climate. These geomorphic provinces are remarkably diverse. They provide spectacular vistas and unique opportunities to learn about Earth's geologic processes and history. The City of Brentwood lies at the boundary of the Great Valley and Coast Range Geomorphic Provinces.

The Great Valley is an alluvial plain about 50 miles wide and 400 miles long in the central part of California. Its northern part is the Sacramento Valley, drained by the Sacramento River, and its southern part is the San Joaquin Valley drained by the San Joaquin River. The Great Valley is a trough in which sediments have been deposited almost continuously since the Jurassic (about 160 million years ago). Great oil fields have been found in southernmost San Joaquin Valley and along anticlinal uplifts on its southwestern margin. In the Sacramento Valley, the Sutter Buttes, the remnants of an isolated Pliocene volcano, rise above the valley floor.

The Coast Range is a northwest-trending mountain range (2,000 to 4,000, occasionally 6,000 feet elevation above sea level) and set of valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. Strata dip beneath alluvium of the Great Valley. To the west is the Pacific Ocean. The coastline is uplifted, terraced and wave-cut. The Coast Range is composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma, and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 600 miles long, extending from Pt. Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands.

Regional Geology

The geology of the region is to a large extent controlled by major active faults in the Coast Range to the west and the alluvial deposits and sediments from the Sacramento-San Joaquin River Delta to the north and east. The City of Brentwood is underlain by Upper Cretaceous marine sedimentary rocks, Eocene marine sedimentary rocks, and Quaternary Marine/Alluvium. The majority of the City of Brentwood is

underlain by Quaternary Marine/Alluvium, which contains mostly nonmarine unconsolidated and semiconsolidated alluvium, lake, playa, and terrace deposits. Upper Cretaceous marine sedimentary rocks consisting of sandstone, shale, and conglomerate are located in the southwestern portion of the City of Brentwood in the hilly terrain. There is a band of Eocene Marine sedimentary rocks consisting of shale, sandstone, conglomerate, and minor limestone located in a band that separates the Quaternary Marine/Alluvium and the Upper Cretaceous.

Faults

Faults are classified as Historic, Holocene, Late Quaternary, Quaternary, and Pre-Quaternary according to the age of most recent movement (California Geological Survey 2002). These classifications are described as follows:

- **Historic:** faults on which surface displacement has occurred within the past 200 years;
- **Holocene:** shows evidence of fault displacement within the past 11,000 years, but without historic record;
- **Late Quaternary:** shows evidence of fault displacement within the past 700,000 years, but may be younger due to a lack of overlying deposits that enable more accurate age estimates;
- **Quaternary:** shows evidence of displacement sometime during the past 1.6 million years; and
- **Pre-Quaternary:** without recognized displacement during the past 1.6 million years.

Faults are further distinguished as active, potentially active, or inactive. (California Geological Survey 2002).

- **Active:** An active fault is a Historic or Holocene fault that has had surface displacement within the last 11,000 years;
- **Potentially Active:** A potentially active fault is a pre-Holocene Quaternary fault that has evidence of surface displacement between about 1.6 million and 11,000 years ago; and
- **Inactive:** An inactive fault is a pre-Quaternary fault that does not have evidence of surface displacement within the past 1.6 million years. The probability of fault rupture is considered low; however, this classification does not mean that inactive faults cannot, or will not, rupture.

There are no known active or potentially active faults located within the City of Brentwood or in the Specific Plan Area. However, there are numerous active faults located in the regional vicinity of Brentwood. Figure 5.4-1 illustrates the location of some of the closest faults. Below is a brief summary of the most notable faults in the regional vicinity:

- **Antioch Fault:** The Antioch fault, which is located in the southwestern portion of the City of Brentwood, was previously considered active and was zoned under the Alquist-Priolo Act as potentially capable of surface rupture. However, studies over the past few decades have indicated that the Antioch fault is not active and does not pose a surface-faulting hazard. The fault is no longer zoned by the State of California as an earthquake fault zone under the Alquist-Priolo Act.
- **Calaveras Fault:** The 75-mile-long Calaveras fault represents a significant seismic source in the southern and eastern San Francisco Bay region. It extends from an intersection with the Paicines fault south of Hollister, through the Diablo Range east of San Jose, and along the Pleasanton-Dublin-San Ramon urban corridor. The fault consists of three major sections: the southern

Calaveras fault (from the Paicines fault to San Felipe Lake), the central Calaveras fault (from San Felipe Lake to Calaveras Reservoir), and the northern Calaveras fault (from Calaveras Reservoir to Danville). The level of contemporary seismicity along the southern section is low to moderate, whereas the central section has generated numerous moderate earthquakes in historic time. The northern section has a relatively low level of seismicity and may be locked. Paleoseismologic studies suggest a recurrence interval for large ruptures of between 250 and 850 years on the northern fault section. The timing of the most recent rupture on the northern Calaveras fault is unknown, but is estimated to have occurred several hundred years ago. Seismologic evidence suggests that the southern and central sections may produce earthquakes as large as MWWm 6.2. Geologic and seismologic data suggest that the northern section may produce earthquakes as large as MWWm 7.0. This fault is located approximately 17 miles southwest of Brentwood.

- **Coast Range-Sierran Block Boundary Zone:** The Coast Range-Sierran Block (CRSB) boundary zone consists of a complex zone of thrust faulting marking the boundary between the Coast Ranges block and the Sierran basement rocks concealed beneath the Great Valley sedimentary sequence of the Sacramento and San Joaquin valleys. The basal detachment within the CRSB is a low-angle, west-dipping thrust accommodating eastward thrusting of the Coast Range block over the Sierran block. Above this detachment is a complex array of west-dipping thrusts and east-dipping back-thrusts. The CRSB extends from near Red Bluff in the northern Sacramento Valley to Wheeler Ridge in the southern San Joaquin Valley. The CRSB was the probable source of the two MWWm 6.25 to 6.75 earthquakes recorded in 1892 near Winters, and the 1983 MWWm 6.5 Coalinga earthquake. The faults do not have surface expression. The CRSB is estimated to be capable of generating maximum earthquakes of MWWm 6.5 to 6.75, with an average recurrence interval of 360 to 440 years. Brentwood is within the CRSB boundary zone.
- **Concord-Green Valley Fault:** The Concord-Green Valley fault is a northwest-striking, right-lateral strike-slip fault zone that extends from the Walnut Creek area across Suisun Bay and continues to the north. The Concord fault extends approximately 12 miles, from the northern slopes of Mt. Diablo to Suisun Bay. North of Suisun Bay, the Green Valley fault continues to the north about 28 miles. The Concord fault is an actively creeping structure that has a long-term creep rate of approximately 5 mm/yr. It is estimated that rupture of both faults would produce a maximum earthquake of about MWWm 6.9 with a recurrence interval of approximately 180 years. This fault is located approximately 15 miles west of Brentwood.
- **Greenville-Marsh Creek Fault:** The Greenville-Marsh Creek fault is a northwest-striking strike-slip fault of the San Andreas system in the northern Diablo Range, extending from Bear Valley to the east side of Mount Diablo. This fault has a lower slip rate than other structures within the San Andreas system with a long-term rate of approximately 1 to 3 mm/yr. This fault produced a moderate magnitude earthquake in 1980. Research is currently being conducted on the fault zone to better constrain its slip rate and its history of past earthquakes. A maximum earthquake of MWWm 6.9 has been estimated to the Greenville fault; the recurrence interval is estimated to be about 550 years. This fault is located approximately 8 miles south/southwest of Brentwood.
- **Hayward Fault:** The Hayward fault is approximately 62 miles long and has been divided into two fault segments: a longer southern segment and a shorter northern segment. This structure is considered to be the most likely source of the next major earthquake in the San Francisco Bay Area. A maximum earthquake of MWWm 6.9 has been estimated for both the northern and southern segments of the Hayward fault. This fault is located approximately 30 miles west of Brentwood.

- **Mount Diablo Thrust Fault:** The Mount Diablo thrust fault is a northeast-dipping structure located beneath the Mount Diablo anticline. This blind thrust fault is estimated to be capable of generating a maximum earthquake of M_W 6.25. This fault is located approximately 12 miles west of Brentwood.
- **Pittsburg-Kirby Hills Fault:** The Pittsburg-Kirby Hills fault extends a distance of approximately 26 miles from the Kirby Hills north of the Sacramento River, to the eastern flank of Mount Diablo. The fault is a right-lateral strike-slip with an estimated maximum earthquake of M_W 6.75. This fault is located approximately 10 miles northwest of Brentwood.
- **Rodgers Creek Fault:** The Rodgers Creek fault is a 38-mile-long, northwest-striking, right-lateral strike-slip fault that extends northward from the projection of the Hayward fault on the south side of San Pablo Bay. Paleoseismic investigations identified evidence for three earthquakes in the last 925 to 1,000 years, yielding a predicted earthquake recurrence interval of 230 years for an earthquake of M_W 7.0. This fault is located approximately 40 miles northwest of Brentwood.
- **San Andreas Fault:** The San Andreas fault is the largest active fault in California, and extends from the Gulf of California to Cape Mendocino. It was the source of the 1906 M_W 7.9 San Francisco earthquake. In the Bay Area, various segments of the fault include the southern Santa Cruz Mountains, possible source of the 1989 M_W 7.0 Loma Prieta earthquake; the Peninsula segment; and the North Coast segment. These segments have been estimated to have a maximum earthquake of M_W 7, M_W 7.1, and M_W 7.9, respectively. This fault is located approximately 45 miles west of Brentwood.
- **West Napa Fault:** The West Napa fault consists of a north-northwest-striking zone of short right-lateral strike-slip fault segments in the hills to the west of the city of Napa. The fault extends about 19 miles from Napa to Yountville. It is characterized by well-defined active fault features such as tonal lineations, scarps in late Pleistocene and Holocene alluvium, closed depressions, and right-laterally deflected drainages. The estimated maximum earthquake for the West Napa fault based on fault length and continuity is M_W 6.5. This fault is located approximately 30 miles northwest of Brentwood.

Seismic Hazards

Seismic hazards include both rupture (surface and subsurface) along active faults and ground shaking, which can occur over wider areas. Ground shaking, produced by various tectonic phenomena, is the principal source of seismic hazards in areas devoid of active faults. All areas of the state are subject to some level of seismic ground shaking.

Several scales may be used to measure the strength or magnitude of an earthquake. Magnitude scales (ML) measure the energy released by earthquake. The Significant United States Earthquakes 1568 – 2009 data published by the USGS in the National Atlas identifies earthquakes that caused deaths, property damage, geologic effects or were felt by populations near the epicenter. No significant earthquakes are identified within Brentwood; however, significant earthquakes are documented in the region. The following table presents the significant earthquakes in the region.

The Richter scale, which represents magnitude at the earthquake epicenter, is an example of an ML. As the Richter scale is logarithmic, each whole number represents a 10-fold increase in magnitude over the preceding number. The following table (Table 5.4-1) represents effects that would be commonly associated with Richter Magnitudes:

TABLE 5.4-1: RICHTER MAGNITUDES AND EFFECTS

MAGNITUDE	EFFECTS
< 3.5	Typically not felt
3.5 – 5.4	Often felt but damage is rare
5.5 – < 6	Damage is slight for well-built buildings
6.1 – 6.9	Destructive potential over ±60 miles of occupied area
7.0 – 7.9	“Major Earthquake” with the ability to cause damage over larger areas
≥ 8	“Great Earthquake” can cause damage over several hundred miles

SOURCE: ASSOCIATION OF BAY AREA GOVERNMENTS, 2013.

Moment Magnitude (Mw) is used by the United States Geological Service (USGS) to describe the magnitude of large earthquakes in the U.S. The value of moment is proportional to fault slip multiplied by the fault surface area. Thus, moment is a measurement that is related to the amount of energy released at the point of movement. The Mw scale is often preferred over other scales, such as the Richter, because it is valid over the entire range of magnitudes. Moment is normally converted to Mw, a scale that approximates the values of the Richter scale.

Seismic ground shaking hazards are calculated as a probability of exceeding certain ground motion over a period of time, usually expressed in terms of "acceleration." The acceleration of the Earth during an earthquake can be described in terms of its percentage of gravity (g). For example, the 10% probability of exceedance in 50 years is an annual probability of 1 in 475 of being exceeded each year. This level of ground shaking has been used for designing buildings in high seismic areas. This probability level allows engineers to design buildings for larger ground motions than what is expected to occur during a 50-year interval, which will make buildings safer than if they were only designed for the ground motions that are expected to occur in the next 50 years.

The California Geological Survey estimates a 10% probability of exceeding 30-50 percent of gravity at peak ground acceleration over the next 50 years in the City of Brentwood, as well as other communities within eastern Contra Costa County. Moving west toward the Hayward fault, the estimates increase up to 70 percent or more of gravity at peak ground acceleration.

In contrast, other scales describe earthquake intensity, which can vary depending on local characteristics. The Modified Mercalli Scale (MM) expresses earthquake intensity at the surface on a scale of I through XII. While there are no known active faults located within the City of Brentwood, the area could experience considerable ground shaking generated by faults outside Brentwood. For example, Brentwood could experience intensities of MM VII to VIII generated by seismic events occurring along the Greenville-Marsh Creek fault or Mt. Diablo thrust fault (ABAG 2012). The following table represents the potential effects of an earthquake based on the Modified Mercalli Intensities.

The Significant United States Earthquakes 1568 – 2009 data published by the USGS in the National Atlas identifies earthquakes that caused deaths, property damage, geologic effects or were felt by populations near the epicenter. No significant earthquakes are identified within Brentwood; however, significant earthquakes are documented in the region. The following table presents the significant earthquakes in the region.

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TABLE 5.4-2: MODIFIED MERCALLI INTENSITIES AND EFFECTS

<i>MM</i>	<i>EFFECTS</i>
I	Movement is imperceptible
II	Movement may be perceived (by those at rest or in tall buildings)
III	Many feel movement indoors; may not be perceptible outdoors
IV	Most feel movement indoors; Windows, doors, and dishes will rattle
V	Nearly everyone will feel movement; sleeping people may be awakened
VI	Difficulty walking; Many items fall from shelves, pictures fall from walls
VII	Difficulty standing; Vehicle shaking felt by drivers; Some furniture breaks
VIII	Difficulty steering vehicles; Houses may shift on foundations
IX	Well-built buildings suffer considerable damage; ground may crack
X	Most buildings and foundations and some bridges destroyed
XI	Most buildings collapse; Some bridges destroyed; Large cracks in ground
XII	Large scale destruction; Objects can be thrown into the air

SOURCE: ASSOCIATION OF BAY AREA GOVERNMENTS, 2013.

The City of Brentwood could also be subject to major earthquakes along currently inactive or unrecognized faults. Two examples in California include the 1983 Coalinga Quake (6.5 magnitude) and the 1994 Northridge Quake (6.7 magnitude), which was an unknown fault, and a “blind” thrust fault over 10 miles below the surface, respectively.

TABLE 5.4-3: SIGNIFICANT EARTHQUAKES IN THE REGION

<i>MAGNITUDE</i>	<i>INTENSITY</i>	<i>LOCATION</i>	<i>YEAR</i>
5.0	VII	Napa	2000
6.9	IX	Loma Prieta (San Andreas)	1989
5.4	N/A	Santa Cruz County	1989
6.2	N/A	Morgan Hill	1984
5.8, 5.8	VII	Livermore	1980
5.7	N/A	Coyote Lake	1979
5.7, 5.6	N/A	Santa Rosa	1969
5.3, 4.2	N/A	Daly City	1957
5.4	N/A	Concord	1954
6.5	N/A	Calaveras fault	1911
7.9	IX	San Francisco	1906
6.8	N/A	Mendocino	1898
6.2	N/A	Mare Island	1898
6.3	N/A	Calaveras fault	1893
6.2	VIII	Winters	1892
6.4	N/A	Vacaville	1892
6.8	VII	Hayward	1868
6.5	VIII	Santa Cruz Mountains	1865
6.8	N/A	San Francisco Peninsula	1838

SOURCE: UNITED STATE GEOLOGICAL SURVEY, 2013.

Seismic Hazard Zones

ALQUIST-PRIOLO FAULT ZONES

An active earthquake fault, per California's Alquist-Priolo Act, is one that has ruptured within the Holocene Epoch (≈11,000 years). Based on this criterion, the California Geological Survey identifies Earthquake Fault Zones. These Earthquake Fault Zones are identified in Special Publication 42 (SP42), which is updated as new fault data become available. The SP42 lists all counties and cities within California that are affected by designated Earthquake Fault Zones. The Fault Zones are delineated on maps within SP42 (Earthquake Fault Zone Maps).

There are no Alquist-Priolo Earthquake Fault Zones located within the City of Brentwood; however, approximately eight miles to the south/southwest lies the Greenville-Marsh Creek fault, 15 miles to the west lies the Concord-Green Valley Fault, and 17 miles to the southwest lies the Calaveras fault, all of which are delineated as Alquist-Priolo Fault Zones. There are four other major faults delineated as Alquist-Priolo Fault Zones between 30 and 50 miles from Brentwood (Hayward fault, West Napa fault, Rodgers Creek fault, and the San Andreas fault). Figure 5.4-1 illustrates the location of the closest Alquist-Priolo Earthquake Fault Zones.

SEISMIC HAZARD ZONES

The State Seismic Hazards Mapping Act (1990) addresses hazards along active faults. The Northern California counties affected by the Seismic Hazard Zonation Program include Alameda, San Francisco, San Mateo and Santa Clara. The Southern California counties affected by the Program include San Bernardino, Los Angeles, Orange, and Ventura. There are no seismic hazard zones currently mapped in Contra Costa County.

Liquefaction

Liquefaction, which is primarily associated with loose, saturated materials, is most common in areas of sand and silt or on reclaimed lands. Cohesion between the loose materials that comprise the soil may be jeopardized during seismic events and the ground will take on liquid properties. Thus, liquefaction requires specific soil characteristics and seismic shaking.

In collaboration with the USGS Earthquake Hazard Program, the California Geological Survey (CGS) produces Liquefaction Susceptibility Maps and identifies "Zones of Required Investigation" per the State's Seismic Hazard Zonation Program.

The article *Mapping Liquefaction-Induced Ground Failure Potential* (Youd and Perkins 1978) provides a generalized matrix to demonstrate the relationship between liquefaction potential and depositional landscapes. The following table, which is recreated from Youd and Perkins, demonstrates the general relationship between the nature and age of sediment and the anticipated liquefaction potential.

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TABLE 5.4-4: LIQUEFACTION POTENTIAL BASED ON SEDIMENT TYPE AND AGE OF DEPOSIT

SEDIMENT	SUSCEPTIBILITY BASED ON AGE OF DEPOSITS (YEARS BEFORE PRESENT)			
	MODERN (< 500 YEARS)	HOLOCENE (< 10,000)	PLEISTOCENE (< 2MILLION)	PRE-PLEISTOCENE (> 2 MILLION)
River Channel	Very High	High	Low	Very Low
Flood Plain	High	Moderate	Low	Very Low
Alluvial Fan/Plain	Moderate	Low	Low	Very Low
Lacustrine/Playa	High	Moderate	Low	Very Low
Colluvium	High	Moderate	Low	Very Low
Talus	Low	Low	Very Low	Very Low
Loess	High	High	High	- ? -
Glacial Till	Low	Low	Very Low	Very Low
Tuff	Low	Low	Very Low	Very Low
Tephra	High	High	- ? -	- ? -
Residual Soils	Low	Low	Very Low	Very Low
Sebka	High	Moderate	Low	Very Low
Un-compacted Fill	Very High	NA	NA	NA
Compacted fill	Low	NA	NA	NA

SOURCE: YOUD AND PERKINS, 1978.

The CGS Liquefaction Susceptibility Maps and “Zones of Required Investigation” are produced per the State’s Seismic Hazard Zonation Program. In Northern California, the areas of high liquefaction potential identified by the CGS are confined to the nine counties comprising the Bay Area, which includes Contra Costa County. Figure 5.4-2 illustrates the liquefaction potential in the vicinity of the Specific Plan Area. As shown in Figure 5.4-2, liquefaction potential in the Specific Plan Area is designated as “medium”.

OTHER GEOLOGIC HAZARDS

Soils

The soils in the City of Brentwood are predominately sediments and recent alluvium. According to the Natural Resource Conservation Service (2016), there are three different soil series located in the Specific Plan Area. These include the Capay, Rincon, and Sycamore series. Figure 5.4-3 presents a map of the soils located in the Specific Plan Area. Information from the NRCS official soil description for these series is provided below.

- The Capay series consists of moderately well drained soils on lower edges of valley fill and on old benches that have been slowly dissected. These soils formed in alluvium from sedimentary rock and have slow runoff and slow permeability. These soils are located throughout the Specific Plan Area on 0 to 9% slopes.
- The Rincon series consists of well-drained soils mainly on benches, formed in alluvial valley fill from sedimentary rock. Runoff varies from slow to medium and permeability is slow. These soils occur throughout the central and northern portions of the Specific Plan Area on slopes between 0 to 2%.

- The Sycamore series consists of poorly drained soils that formed in alluvium from sedimentary rock. These soils are on flood plains. These soils occur in the south-central and southeastern portions of the Specific Plan Area, associated with Sand Creek on relatively flat terrain.

Erosion

The U.S. Natural Resource Conservation Service (NRCS) delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of erosion factors is provided by the NRCS Physical Properties Descriptions:

- Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Erosion factor Kw indicates the erodibility of the whole soil, whereas Kf indicates the erodibility of the fine soils. The estimates are modified by the presence of rock fragments.

Soil erosion data for the Specific Plan Area were obtained from the NRCS. As identified in the table below, the erosion factor Kf varies from 0.15 to 0.37, which is considered moderately low to moderate potential for erosion.

TABLE 5.4-5: SOIL EROSION FACTORS

MAP SYMBOL AND SOIL NAME	K _F	REPRESENTATIVE VALUE		
		% SAND	% SILT	% CLAY
CaA: Capay Clay, 0-2% slopes	0.20	28.1	29.4	42.5
RbA: Rincon Clay Loam, 0-2% slopes	0.28	35.4	33.6	31
Sp: Sycamore Silty Clay Loam, Clay Substratum	0.37	6.7	62.3	31

SOURCE: UNITED STATES AGRICULTURAL SERVICE (USDA) NATURAL RESOURCE CONSERVATION SERVICE (NRCS), 2016.

Expansive Soils

The NRCS delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of linear extensibility (also known as shrink-swell potential or expansive potential) is provided by the NRCS Physical Properties Descriptions:

"Linear extensibility" refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

The linear extensibility of the soils within Brentwood ranges from Low to High. Figure 5.4-4 illustrates the shrink-swell potential of soils in the Specific Plan Area. The majority of the Specific Plan Area has moderate or high expansive soils, including most of the undeveloped land. A small part of the south-central and southeastern portion of the Specific Plan Area has low expansive soils. The areas with

moderate to high expansive soils would require special design considerations due to shrink-swell potentials.

Landslide

The California Geological Survey classifies landslides with a two-part designation based on Varnes (1978) and Cruden and Varnes (1996). The designation captures both the type of material that failed and the type of movement that the failed material exhibited. Material types are broadly categorized as either rock or soil, or a combination of the two for complex movements. Landslide movements are categorized as falls, topples, spreads, slides, or flows.

Landslide potential is influenced by physical factors, such as slope, soil, vegetation, and precipitation. Landslides require a slope, and can occur naturally from seismic activity, excessive saturation, and wildfires, or from human-made conditions such as construction disturbance, vegetation removal, wildfires, etc.

Within Contra Costa County, the hillsides have some susceptibility for landslides, while the valleys have a low susceptibility. Figure 5.4-5 illustrates the landslide potential in the vicinity of the Specific Plan Area. Given the relatively level slopes throughout the Specific Plan Area, the landslide potential is very low. This is not a significant constraint in the Specific Plan Area. The landslide potential increases in the higher elevation areas to the west and south of the Specific Plan Area.

Lateral Spreading

Lateral spreading generally is a phenomenon where blocks of intact, non-liquefied soil move down slope on a liquefied substrate of large areal extent. The potential for lateral spreading is present where open banks and unsupported cut slopes provide a free face (unsupported vertical slope face). Ground shaking, especially when inducing liquefaction, may cause lateral spreading toward unsupported slopes. There is a low potential for lateral spreading in the Specific Plan Area, given the Specific Plan Area's lack of hilly terrain.

Subsidence

Subsidence is the settlement of soils of very low density generally from either oxidation of organic material, or desiccation and shrinkage, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. In Contra Costa County, subsidence occurs in the Delta plain and is caused by the natural process of oxidation of island peat soils, resulting in a gradual sinking of the ground. As many of the islands in the Delta (along with their levees) sink in elevation, the levees that protect the island's agricultural and/or residential uses must be raised and reinforced by adding more earth fill to the top of the levees.

Recent evidence indicates that many Delta islands in the region have experienced significant subsidence over the last several decades. For example, it is estimated that Webb Tract in Contra Costa County has subsided up to 17 feet. Most reclaimed portions of the Delta in the County have subsided at least 10 feet. Subsidence in the City of Brentwood, which includes the Specific Plan Area, has not been considered a significant issue, although Delta lands to the north and east of the City will continue to be a significant concern.

Corrosivity

Corrosivity refers to potential soil-induced electrochemical or chemical action that could corrode or deteriorate concrete, reinforcing steel in concrete structures, and bare-metal structures exposed to

these soils. The rate of corrosion is related to factors such as soil moisture, particle-size distribution, and the chemical composition and electrical conductivity of the soil. The natural soils found in the Specific Plan Area may be moderately corrosive. The materials used in the construction of modern infrastructure is typically designed to resist the effects of corrosion over the design life of the infrastructure. In addition, native soils are typically replaced by engineered backfill which generally has a low corrosive potential.

Naturally Occurring Asbestos

The term “asbestos” is used to describe a variety of fibrous minerals that, when airborne, can result in serious human health effects. Naturally occurring asbestos is commonly associated with ultramafic rocks and serpentinite. Ultramafic rocks, such as dunite, peridotite, and pyroxenite are igneous rocks comprised largely of iron-magnesium minerals. As they are intrusive in nature, these rocks often undergo metamorphism, prior to their being exposed on the Earth’s surface. The metamorphic rock serpentinite is a common product of the alteration process. Naturally occurring asbestos is mapped in Contra Costa County, although it is all located to the west of the City in mountainous areas. There is no naturally occurring asbestos mapped within Brentwood, which includes the Specific Plan Area.

Tsunami and Seiches

Tsunamis and seiches are standing waves that occur in the ocean or relatively large, enclosed bodies of water (i.e., Lake Tahoe) that can follow seismic, landslide, and other events from local sources (California, Oregon, Washington coast) or distant sources (Pacific Rim, South American Coast, Alaska/Canadian coast). The City of Brentwood is not within a tsunami or seiche hazard area.

STRUCTURAL DAMAGE

Fault Rupture Damage. There are no known active faults that have been mapped within the City of Brentwood, and the potential for structures to be adversely affected by fault rupture is considered to be relatively low based on the absence of known faults. The California Geological Survey has not established any Alquist-Priolo Earthquake Fault Zones in the City of Brentwood. It is possible that future investigation could identify active faults in the City. Fault rupture hazards in the Specific Plan Area should be reevaluated if data suggests that such a hazard is present.

Ground Shaking Damage. As is the case for most areas within California, the potential for seismic ground shaking in the Specific Plan Area is expected. As a result, the State requires special design considerations for all structural improvements in accordance with the seismic design provisions in the California Building Code. California’s seismic design provisions require enhanced structural integrity based on several risk parameters with the ultimate objective of protecting the life and safety of building occupants and the public. For large earthquakes, the seismic design standards primarily ensure that the building will not collapse, but some structural and non-structural damage may be expected. Older buildings constructed of unreinforced masonry, including materials such as brick, concrete, and stone, pre-1940 wood frame houses, and pre-1973 tilt-up concrete buildings are particularly susceptible to structural damage from ground shaking. In most cases, these older buildings require retrofit, or they risk significant structural damage during an earthquake.

Liquefaction Damage. The liquefaction potential in the Specific Plan Area varies from “very low” to “high,” with the majority of the Specific Plan Area designated “moderate” or “high.” Liquefaction poses a substantial source of hazard to structures and infrastructure located throughout the Specific Plan Area. There are a variety of geotechnical strategies that can be implemented to mitigate the potential for

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structural damage. These include appropriate foundation design, engineering soils, groundwater management, and the use of special flexible materials for construction.

Landslide and Lateral Spreading Damage. Given the relatively level slopes throughout the Specific Plan Area, the landslide and lateral spreading potential is very low. The landslide and lateral spreading potential increases some in the higher elevation terrain to the west and south of the Specific Plan Area. There are a variety of geotechnical strategies that can be implemented to mitigate the potential for landslide and lateral spreading in this area. These include engineering soils, groundwater management, surface water control, slope reconfiguration, and structural reinforcement if necessary.

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5.5 MINERAL AND ENERGY RESOURCES

This section describes mineral and energy resources in the City of Brentwood and within the Specific Plan Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect mineral and energy resources in the Specific Plan Area.

REGULATORY SETTING

STATE

Surface Mining and Reclamation Act of 1975

The California Department of Conservation Surface Mining and Reclamation Act of 1975 (§ 2710), also known as SMARA, provides a comprehensive surface mining and reclamation policy that permits the continued mining of minerals, as well as the protection and subsequent beneficial use of the mined and reclaimed land. The purpose of SMARA is to ensure that adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition and readily adaptable for alternative land uses. The production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, wildlife, range and forage, as well as aesthetic enjoyment. Residual hazards to public health and safety are eliminated. These goals are achieved through land use planning by allowing a jurisdiction to balance the economic benefits of resource reclamation with the need to provide other land uses.

If a use is proposed that might threaten the potential recovery of minerals from an area that has been classified mineral resource zone 2 (MRZ-2), SMARA would require the jurisdiction to prepare a statement specifying its reasons for permitting the proposed use, provide public notice of these reasons, and forward a copy of the statement to the State Geologist and the State Mining and Geology Board (Cal. Pub. Res. Code Section 2762). Lands classified MRZ-2 are areas that contain identified mineral resources.

LOCAL

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following policies related to mineral and energy resources:

Conservation and Open Space Element

GOAL COS 5 – Utilize Brentwood’s mineral resources while preserving development and conservation options for the future.

POLICY COS 5.1 - Ensure that areas of mineral resources can be mined while productive and are ultimately reused for urbanization or open space.

POLICY COS 5.2 - Allow resource extraction of gas, oil, and mineral resources as an interim use.

Action COS 5a: Work with property owners to develop reclamation plans for areas with mineral resources.

Action COS 5b: Continue to implement, and periodically review/update as necessary, Chapter 17.680 (Oil and Gas Production) of the Brentwood Municipal Code.

Action COS 5c: Identify and evaluate areas within Brentwood’s Planning Area with potential resource value, including oil, gas, sand, and gravel.

GOAL COS 9 – Promote conservation of energy and other natural resources.

POLICY COS 9.1 - Require all new public and privately constructed buildings to meet and comply with the most current “green” development standards in the California Code of Regulations (CCR), Title 24.

POLICY COS 9.2 - Support innovative and green building best management practices including, but not limited to, LEED certification for all new development, and encourage project applicants to exceed the most current “green” development standards in the California Code of Regulations (CCR), Title 24, if feasible.

POLICY COS 9.3 - Promote the use of alternative energy sources in new development.

POLICY COS 9.4 - Incorporate innovative green building techniques and best management practices in the site design, construction, and renovation of all public projects.

POLICY COS 9.10 - Ensure that the layout and design of new development and significant remodels encourages the use of transportation modes other than automobiles and trucks.

POLICY COS 9.13 - Continue to encourage and support the use of bicycles as an alternative means of transportation.

Action COS 9a: Continue to review development projects to ensure that all new public and private development complies with the California Code of Regulations (CCR), Title 24 standards as well as the energy efficiency standards established by the General Plan and the Brentwood Municipal Code.

Action COS 9b: Connect residents and businesses with programs that provide free or low-cost energy efficiency audits and retrofits to existing buildings.

Action COS 9c: Explore amending the Brentwood Municipal Code to incentivize the use of small-scale renewable energy facilities and, where appropriate, to remove impediments to such uses.

Chapter 17.680, Oil and Gas Production, Brentwood Municipal Code

The purpose of the oil and gas production regulations in the Brentwood Municipal Code is to establish reasonable and uniform limitations, safeguards and controls for the present operation of and future drilling for and production of oil, gas, and other hydrocarbon substances within the city, so that such activities may be conducted in harmony with other uses of land within the city, thus protecting the people of the city in the enjoyment and use of their property and providing for their comfort, health, safety, and general welfare.

ENVIRONMENTAL SETTING

Mineral Resource Classification

Pursuant to the Surface Mining and Reclamation Act of 1975 (SMARA), the California State Mining and Geology Board oversees the Mineral Resource Zone (MRZ) classification system. The MRZ system

5.0 CONSERVATION AND NATURAL RESOURCES

characterizes both the location and known/presumed economic value of underlying mineral resources. The mineral resource classification system uses four main MRZs based on the degree of available geologic information, the likelihood of significant mineral resource occurrence, and the known or inferred quantity of significant mineral resources. The four classifications are described in Table 5.5-1 below.

TABLE 5.5-1: MINERAL RESOURCE CLASSIFICATION SYSTEM

<i>CLASSIFICATION</i>	<i>DESCRIPTIONS</i>
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated.
MRZ-4	Areas where available information is inadequate for assignment to any other MRZ classification.

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION DIVISION OF MINES AND GEOLOGY, 2002.

Mineral Resources

Rocks exposed within the City of Brentwood are predominantly sediments of the late Cretaceous and Eocene Age (36 to 75 million years ago). The low-lying hills in the western portion of the city mark the easternmost portion of the Coast Range geomorphic province. Sediments throughout most of the city consist of young (Quaternary Age) alluvial deposits. The recent alluvial deposits consist of the clay, silt, sand, and gravel exposed throughout the low, flat lying portions of the city. Within the city, mineral resources include sand, gravel, coal, oil, and gas.

Historically, large amounts of sand were mined from the dune sands of the northern portion of Brentwood, but competition from sand and gravel pits in the Tracy and Livermore areas caused a gradual decline in the production of Brentwood sands. The sand is yellow-brown in color, fine grained, angular, and generally unconsolidated.

Specialty sand has also been mined from Domengine sandstone deposits that traverse the City of Brentwood between Deer Valley Road to the northwest and the southeast corner of the city. The Domengine sandstone typically consists of light brown, fine to medium grained, angular, and compact sand, which has a high silica content.

Most of the rock outcrops within the city are soft, low density, and fine grained. Therefore, they do not yield substantial rip-rap or crushed rock aggregate products. Gravel production in Brentwood has historically been insignificant. It is possible that some of the massive sandstones exposed along the western portion of the city may have some limited value for use as rip-rap.

Coal is found within the southern and western portions of the city, and coal mines were active from 1861 to 1902. The seams of sub-bituminous coal have been mined in the southwestern portion of the city, near the intersection of Briones Valley Road and Concord Avenue. According to reports by the State Mineralogist, the coal consists of thin seams, one to seven feet thick, diving deep into the earth. Mining extended to great depths along the beds, and consequently the costs became prohibitive. Rising excavation costs combined with competition from higher grade coal and the use of petroleum limited coal production in the Brentwood.

Oil and gas has been sporadically produced in the region since 1864. The Brentwood oil and gas field is California's northernmost commercial oil-producing area. The field was discovered in June 1962 by Shell, Occidental, and Brazos' joint well, Heidorn 4-4. The area was developed as a gas field until the discovery of oil in the Ginocchio 2-16 well in December 1962. By December 1965, there were 50 producing wells in the Brentwood field. Of these, 15 produced predominantly gas with small quantities of associated oil. The other 35 wells produced oil and gas at different ratios.

The Paleocene and Cretaceous reservoir beds dip north at a low angle and are truncated by a south-dipping unconformity surface, which is overlain by a widespread "Meganos gorge" shale unit that provides the major updip trap of the oil and gas pools. The field is traversed by a series of northwest-striking normal faults. The oil-producing portion of the Brentwood field consists of three producing zones in massive sandstone beds separated by shale bodies. These are the First Massive Martinez sand of Paleocene age, the Second Massive Martinez sand of Paleocene age, and the Third Massive Martinez sand of Late Cretaceous C- and D-1-Zone ages. The oil is in 25-100-ft columns overlain by gas caps ranging upward to 250 ft in thickness. Thinly bedded Upper Martinez sandstone stringers, known as the "Heidorn" and "Ginocchio" sands, are about 500-800 ft above the First Massive Martinez and produce essentially dry gas with only minor quantities of condensate. At peak production in 1981, the Brentwood oil and gas field produced 15.1 cubic feet of gas and 24,978 barrels of condensate.

The plugged wells in the Specific Plan Area are presented in Figure 5.5-1. As shown in the figure, the plugged wells include dry gas, dry hole, and oil and gas. The potential for additional oil and gas reserves exists within the Specific Plan Area. Prior to development on a site that contains a plugged well, a Well Destruction Permit must be obtained. State and local regulations govern the procedure for eliminating these wells. These requirements are applicable to abandoned wells, test holes, dry holes, cone penetrometers, hydropunches and soil borings. A permit from Contra Costa Environmental Health is required to destroy a well in Contra Costa County. The law requires that such work be performed by a licensed, insured and bonded well contractor (C-57 license).

To apply for a well destruction permit, a completed application, plot plan, and permit fee shall be submitted to Contra Costa Environmental Health. The Environmental Health staff will review the permit application and, if acceptable, a permit will be issued. Once the Well Destruction Permit has been issued, the authorized work can begin. A copy of the approved permit must be kept somewhere on the job site. This is to ensure that it is available for reference by the work crew should questions arise: A general outline of the process is as follows:

1. Remove any obstructions from the well.
2. Perforate or remove the well casing to the bottom of the well.
3. Excavate around the casing to a depth of 6 feet.
4. Place approved sealing material in the well extending from the bottom to the surface. Environmental Health staff will inspect this stage of the work. The well contractor is responsible for contacting Contra Costa Environmental Health to schedule inspection appointments. The greater the advance notice, the more likely a mutually convenient inspection appointment can be arranged.

Upon satisfactory completion of the work permitted and submittal of a Well Completion Report (DWR 188 form), a final destruction approval will begin.

In general, sand is likely the most significant economic mineral deposit found within the City of Brentwood. It is possible that significant deposits of coal and specialty sand remain in the western

5.0 CONSERVATION AND NATURAL RESOURCES

portion of the city, within the Domengine sandstone. Dry gas is presently being produced in the northeast portion of the city, and the potential for additional reserves exists throughout the City of Brentwood in general and the Specific Plan Area in particular.

Location of Mineral Resources

The California Office of Mine Reclamation periodically publishes a list of qualified permitted aggregate mines regulated under SMARA that is generally referred to as the AB 3098 List. The Public Contract Code precludes mining operations that are not on the AB 3098 List from selling sand, gravel, aggregates or other mined materials to State or local agencies. As of January 1, 2013, there are 3 aggregate mines on the AB 3098 list in Contra Costa County. Table 5.5-2 identifies the active aggregate mines located in the county. None of the three listed mines are within the City of Brentwood, or by extension, within the Specific Plan Area.

TABLE 5.5-2: AB 3098 LIST – ACTIVE MINES IN CONTRA COSTA COUNTY

<i>MINE ID</i>	<i>MINE NAME</i>	<i>MINE OPERATOR</i>
91-07-0001	Byron Plant	G3 Enterprises
91-07-0003	Clayton Quarry	Hanson Aggregates
91-07-0004	Clayton	CEMEX Construction Materials Pacific, LLC

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION DIVISION OF MINES AND GEOLOGY, 2013.

REFERENCES

California Department of Conservation. 1995. South Oakley and East Brentwood Gas Fields, Publication Number TR46.

California Department of Conservation. 2002. California Geological Survey, Note 36.

California Department of Conservation. 2013. Division of Mines and Geology. AB 3098 List.

5.6 HYDROLOGY AND WATER QUALITY

Provided below is a discussion of the flooding hazards, creeks and stormwater/flood control systems that serve the City of Brentwood, which may affect the Specific Plan Area.

REGULATORY SETTING

FEDERAL

Clean Water Act (CWA)

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The State Water Resources Control Board (SWRCB) is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits). The SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0005-DWQ) for small Municipal Separate Storm Sewer Systems (MS4s) covered under the CWA to efficiently regulate numerous storm water discharges under a single permit, however, this does not apply to Brentwood. The Central Valley RWQCB has issued a large municipality permit to cities in Contra Costa County, including Antioch, Brentwood, and Oakley, as well as unincorporated portions in the east County (WDR Order R-5-2010-2012, NPDES Permit No. CA5083313, 9/23/10). Permittees must meet the requirements in Provision D of the General Permit, which require the development and implementation of a Storm Water Management Plan (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable. The SWMP must include the following six minimum control measures:

1. Public Education and Outreach on Storm Water Impacts
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Storm Water Runoff Control
5. Post-Construction Storm Water Management in New Development
6. Redevelopment and Pollution Prevention/Good Housekeeping for Municipal Operations

National Pollutant Discharge Elimination System (NPDES)

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, oceans, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the EPA Regional Administrator (EPA Region 9). The terms of these NPDES permits implement pertinent provisions of the Federal Clean Water Act and the Act's

implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWA.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and therefore must be updated regularly. The rapid and dramatic population and urban growth in the Central Valley Region has caused a significant increase in NPDES permit applications for new waste discharges. To expedite the permit issuance process, the RWQCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issued general permits for stormwater runoff from construction sites statewide. Stormwater discharges from industrial and construction activities in the Central Valley Region can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB.

Federal Emergency Management Agency (FEMA)

FEMA operates the National Flood Insurance Program (NFIP). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the California Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

Rivers and Harbors Appropriation Act of 1899

One of the country's first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

Water Pollution Control Act of 1972

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States.

STATE

California Water Code

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the Regional Water Quality Control Boards (RWQCBs) power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Water Quality Control Plan for the Sacramento and San Joaquin River Basins

The Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan) includes a summary of beneficial water uses, water quality objectives needed to protect the identified beneficial uses, and implementation measures. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The term “water quality standards,” as used in the Federal Clean Water Act, includes both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others that are necessary to achieve and maintain the water quality standards.

The RWQCB regulates waste discharges to minimize and control their effects on the quality of the region’s ground and surface water. Permits are issued under a number of programs and authorities. The terms and conditions of these discharge permits are enforced through a variety of technical, administrative, and legal means. Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. The Basin Plan reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code and the Clean Water Act.

Assembly Bill 162

This bill requires a general plan’s land use element to identify and annually review those areas covered by the general plan that are subject to flooding as identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources (DWR). The bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a State-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

Assembly Bill 70

This bill provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by a flood to the extent that it has increased the State’s exposure to liability for property damage by unreasonably approving, as defined, new development in a previously undeveloped area, as defined, that is protected by a State flood control project, unless the city or county meets specified requirements.

CA Government Code

The Senate and Assembly bills identified above have resulted in various changes and additions to the California Government Code. Key sections related to the above referenced bills are identified below.

Section 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

Section 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

Section 8589.4

California Government Code §8589.4, commonly referred to as the Potential Flooding-Dam Inundation Act, requires owners of dams to prepare maps showing potential inundation areas in the event of dam failure. A dam failure inundation zone is different from a flood hazard zone under the National Flood Insurance Program (NFIP). NFIP flood zones are areas along streams or coasts where storm flooding is possible from a “100-year flood.” In contrast, a dam failure inundation zone is the area downstream from a dam that could be flooded in the event of dam failure due to an earthquake or other catastrophe. Dam failure inundation maps are reviewed and approved by the California Office of Emergency Services (OES). Sellers of real estate within inundation zones are required to disclose this information to prospective buyers.

LOCAL

Contra Costa Clean Water Program

To comply with the Federal Clean Water Act, Contra Costa County, its 19 incorporated cities and the Contra Costa County Flood Control & Water Conservation District have joined together to form the Contra Costa Clean Water Program (CCCWP). The CCCWP strives to eliminate stormwater pollution through public education, inspection and enforcement activities, and industrial outreach. The Contra Costa Clean Water Program is dedicated to maintaining a healthy environment in Contra Costa’s creeks, rivers, the Delta, and the Bay.

Stormwater C.3 Guidebook

Through the Contra Costa Clean Water Program, Contra Costa municipalities have prepared a *Stormwater C.3 Guidebook* to assist applicants through the process of Provision C.3 in the Municipal Regional Permit (MRP) in Contra Costa County. Provision C.3 of the MRP requires site designs for new developments and redevelopments to minimize the area of new roofs and paving. The Guidebook was last updated in April 2016.

City of Brentwood Municipal Code Chapter 14.20

Chapter 14.20 of the City of Brentwood Municipal Code describes the conditions of the city’s national pollutant discharge elimination system (NPDES) permit. The intent of the chapter of the city Municipal Code is to protect and enhance the water quality of the city of Brentwood’s watercourses pursuant to, and consistent with the Porter-Cologne Water Quality Control Act and the Federal Clean Water Act. The Chapter also carries out the conditions of the city’s NPDES permit.

East Contra Costa County Municipal NPDES Permit Waste Discharge Requirements Order R5-2010-0102 NPDES Permit No. CAS083313 23 September 2010

In response to the Federal Clean Water Act, the Contra Costa Clean Water Program regulates waste dischargers under a National Pollutant Discharge Elimination System (NPDES) Permit administered by the appropriate Regional Water Quality Control Board. Specifically, the municipalities are regulated with regard to their jurisdiction over and/or maintenance responsibility for municipal storm drain systems and watercourses that they own or operate. The NPDES Permit is concerned primarily with regulating trash, pollutants of concern, and excessive hydrologic runoff which can carry sediment and cause flooding.

Contra Costa Clean Water Program Stormwater Management Plan 1999-2004

This Stormwater Management Plan (SWMP) serves as the basis for the Contra Costa Clean Water Program's National Pollutant Discharge Elimination System (NPDES) Permit application to the Central Valley Regional Water Quality Control Board.

Start at the Source: Design Guidance Manual for Stormwater Quality Protection

This document is intended for use in the planning and design phases of residential, commercial, institutional, and industrial development and redevelopment. It recognizes that one of the best opportunities to reduce the generation of urban runoff or “nonpoint source pollution” from development is through planning and design. This document provides Best Management Practices including principles and techniques for basic siting and design considerations, construction phase strategies, and post construction property management practices.

City of Brentwood General Plan

The existing City of Brentwood General Plan identifies the following policies related to hydrology and water quality:

Infrastructure Element

GOAL IF 4 – Provide adequate storm drainage facilities.

POLICY IF 4-1 - Maintain and improve Brentwood's storm drainage facilities.

POLICY IF 4-2 - Incorporate recreational trails and parkway vegetation design in channel improvements, and explore utilizing detention basins for parks, ball fields, and equestrian areas.

POLICY IF 4-3 - Require all development projects to demonstrate how storm water runoff will be detained or retained on-site and/or conveyed to the nearest drainage facility as part of the development review process and as required by the City's NPDES Municipal Regional Permit. Project applicants shall mitigate any drainage impacts as necessary.

POLICY IF 4-4 - Maintain drainage channels in a naturalized condition to the greatest extent feasible, subject to health and safety requirements and as otherwise described in the Conservation and Open Space Element of the General Plan.

POLICY IF 4-5 - Continue to work cooperatively with outside agencies such as the Contra Costa County Flood Control & Water Conservation District regarding storm drainage issues.

Safety Element

Action SA 2e - Maintain unimproved drainage channels on a periodic basis.

Action SA 2f - As part of the development review process, require developers to prepare hydrological studies as necessary. Studies shall encompass the project site as well as the entire drainage area.

Conservation and Open Space Element

GOAL COS 4: Protect and enhance water resources in local creeks, riparian habitat, wetlands, the Marsh Creek Watershed, and aquatic habitat.

Policy COS 4-1: Where feasible, protect and enhance surface water quality in creeks, streams, channels, seasonal and permanent marshland, wetlands, sloughs, riparian habitat, and vernal pools through sound land use planning, community design, and site planning.

Policy COS 4-2: Rehabilitate existing channelized waterways, as feasible, to remove concrete linings and allow for a connection with the stream channel and the natural water table. Avoid creating additional channelized waterways, unless no other alternative is available to protect human health, safety, and welfare.

Policy COS 4-3: Where feasible, restore existing channelized waterways to a more natural condition. Restoration efforts should provide for naturalized hydraulic functioning. Restoration should also promote the growth of riparian vegetation to effectively stabilize banks, screen pollutants from runoff entering the channel, enhance fisheries, and provide other opportunities for natural habitat restoration.

Policy COS 4-4: Require discretionary projects, as well as new flood control and storm water conveyance projects, to integrate best management practices and natural features to the greatest extent feasible, while ensuring that these features adequately convey and control storm water to protect human health, safety, and welfare.

Policy COS 4-5: Encourage the use of natural features such as bio swales, vegetation, retention ponds, and other measures to remove storm water pollutants prior to discharge, subject to State regulations.

Policy COS 4-6: Where feasible, new development adjacent to creeks and streams should include opportunities for beneficial uses, such as flood control, ecological restoration, public access trails, and walkways.

Policy COS 4-7: Consult with State and Federal agencies during the development review process to help identify wetland and riparian habitat that has candidacy for restoration, conservation, and/or mitigation. Focus restoration and/or conservation efforts on areas that would maximize multiple beneficial uses for such habitat.

Policy COS 4-8: Conserve riparian habitat along local creeks, including but not limited to Marsh Creek, Deer Creek, Dry Creek, and Sand Creek, in order to maintain water quality and provide suitable habitat for native fish and plant species.

Policy COS 4-9: Consider the effects of development on ground and surface water quality, and implement measures to reduce water contamination.

Policy COS 4-10: Where feasible, encourage and support multipurpose detention basins that provide water quality protection, storm water detention, open space amenities, and recreational amenities.

Action COS 4a: Coordinate with interested public and private entities to create new and expanded public access trails along creeks and streams that connect to parks and open space areas within Brentwood's Planning Area.

Action COS 4b: Continue to identify which storm water and drainage facilities are in need of repair and address these needs through the City's Capital Improvement Program.

Action COS 4c: Utilize existing regulations and procedures, including but not limited to, the Zoning Ordinance and the environmental review process, in order to conserve wetlands and riparian habitat within the city limits and the Planning Area.

Action COS 4d: Coordinate with the California Department of Fish and Wildlife, Contra Costa County, and local watershed protection groups to identify potentially impacted aquatic habitat within Brentwood's Planning Area and to develop riparian management guidelines to be implemented by development, recreation, and other projects adjacent to creeks, streams, and other waterways.

Action COS 4e: Continue to implement, and periodically review/update as necessary, Chapter 15.52 (Grading, Erosion and Sediment Control) of the Brentwood Municipal Code. The City shall review projects to ensure that best management practices are implemented during construction and site grading activities, as well as in project design to reduce pollutant runoff into water bodies.

Action COS 4f: Explore revising Title 17 (Zoning) of the Brentwood Municipal Code to include standards for creek setbacks and the protection of riparian habitat along creek corridors. The standards should include minimum setback requirements, site design standards, and requirements for the ongoing maintenance of creek and riparian habitat on public and private lands.

Action COS 4g: Update the Creek Trails and Revegetation Master Plan. Solicit public input during the preparation of the update, and include outreach efforts to community organizations with knowledge of and interest in key issues associated with local creeks, trails, and habitat restoration.

Action COS 4h: Encourage volunteer-based programs that organize community creek restoration and/or clean-up events and provide public education regarding the benefits of city and regional water resources.

WATERSHEDS

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special-status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State of California uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 5.6-1 shows the primary watershed classification levels used by the State of California. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

TABLE 5.6-1: STATE OF CALIFORNIA WATERSHED HIERARCHY NAMING CONVENTION

<i>WATERSHED LEVEL</i>	<i>APPROXIMATE SQUARE MILES (ACRES)</i>	<i>DESCRIPTION</i>
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

SOURCE: CALWATER, CALIFORNIA INTERAGENCY WATERSHED MAPPING COMMITTEE 2008

HYDROLOGIC REGION

The Specific Plan Area is located within the San Joaquin River Hydrologic Region, which covers approximately 9.7 million acres (15,200 square miles) and includes all of Calaveras, Tuolumne, Mariposa, Madera, San Joaquin, and Stanislaus counties, most of Merced and Amador counties, and parts of Alpine, Fresno, Alameda, Contra Costa, Sacramento, El Dorado, and San Benito counties. Significant geographic features include the northern half of the San Joaquin Valley, the southern part of the Sacramento-San Joaquin Delta, the Sierra Nevada, and the Diablo Range. The region is home to about 1.6 million people. Major population centers include Merced, Modesto, and Stockton.

HYDROLOGIC UNIT

The Specific Plan Area is split between two hydrologic units (HUC 8): the San Joaquin Delta hydrologic unit and the North Diablo Range hydrologic unit. The majority of the Specific Plan Area is within the San Joaquin Delta hydrologic unit; however, a portion of the northwestern corner of the Specific Plan Area is within the North Diablo Range hydrologic unit. The San Joaquin Delta hydrologic unit drains to the San Joaquin River and Delta region, which drains to the San Francisco Bay. The North Diablo hydrologic unit drains into the various creeks located nearby. The Lower Sacramento hydrologic unit is located to the north and the Suisun Bay hydrologic unit is located to the east. Figure 5.6-2 illustrates the boundaries of the hydrologic units relative to the Specific Plan Area.

HYDROLOGIC AREA

For purposes of planning on a city-wide basis, hydrologic areas are generally considered to be the appropriate watershed planning level. As a planning area becomes smaller the hydrologic area level may be too large in terms of scale, and a hydrologic subarea may be considered more appropriate. The Specific Plan Area is located within an undefined hydrologic area. Figure 5.6-3 illustrates the boundaries of this undefined hydrologic area relative to the Specific Plan Area.

HYDROLOGIC SUB-AREA

There are numerous hydrologic sub-areas within and throughout Brentwood and the Specific Plan Area. Although analysis of hydrologic sub-areas is appropriate for the review of individual projects, it is not appropriate for the watershed analysis of the Specific Plan Area.

CREEKS AND FLOOD CONTROL FACILITIES

Brentwood is almost completely within the Marsh Creek Watershed. The watershed includes 60,000 acres of urban, scenic hills, and rural/agricultural land. The watershed has about 15% impervious coverage. The watershed extends from the eastern side of the Mount Diablo foothills downstream to the San Joaquin River Delta at Big Break. The average annual rainfall for this watershed is 17 inches (CCCCDP Nov 2003). The average annual rainfall for the City of Brentwood is approximately 12 inches (CCCPWD).

The largest creek draining this watershed is Marsh Creek, which generally flows from the east to the west near the southern boundary of the watershed and from the south to the north near the eastern boundary of the watershed. Marsh Creek flows from the south to the north through the center of the City of Brentwood. Within the city, the upstream segment (southern quarter) of the creek is still a natural creek; however, the downstream segment of the creek has been converted from a natural creek to a flood control channel (CCCCDP 2003). The Reservoir and Dam are owned and operated by the Contra Costa County Flood Control and Water Conservation District (CCFCWCD) (Consolacion 2013). The dam reduces the flow rate in Marsh Creek, thereby reducing the potential for flooding along the creek within the City of Brentwood. Dry Creek, Deer Creek, and Sand Creek each flow from the west to the east and join Marsh Creek within the City of Brentwood.

Sand Creek is located north of Deer Creek near the center of the city, and is located along a portion of the Specific Plan Area's southern boundary. Sand Creek is about 19 miles long (CCCCDP 2003). Within the city, the eastern segment of Sand Creek has been converted to a flood control channel. The Upper Sand Creek Basin is located along Sand Creek west of the city (Consolacion 2013). The Lower Sand Creek Basin is located within the city near the intersection north of Sand Creek Road and east of Highland Road. The CCFCWCD is currently in the process of designing and constructing an expansion of the Upper Sand Creek Basin so that it will provide a greater level of downstream flood protection. Each of these facilities reduce the flow in Sand Creek, thereby reducing the potential for flooding downstream of the facility.

The City of Brentwood owns and operates most of the smaller storm drainage systems within the city. Additionally, the City owns two detention basins in The Vineyards subdivision. There are no stormwater pump stations within the city. In addition to the major CCFCWCD facilities described above, the CCFCWCD also owns several trunk storm drains and smaller detention basin facilities (Consolacion 2013). The storm drains generally range in size from 24-inches to 72-inches in diameter. The smaller detention basins provide up to about 125 acre-feet of runoff storage.

STORMWATER QUALITY

Potential hazards to surface water quality include the following nonpoint pollution problems: high turbidity from sediment resulting from erosion of improperly graded construction projects, concentration of nitrates and dissolved solids from agriculture or surfacing septic tank failures, contaminated street and lawn run-off from urban areas, and warm water drainage discharges into cold water streams.

The most critical period for surface water quality is following a rainstorm which produces significant amounts of drainage runoff into streams at low flow, resulting in poor dilution of contaminants in the low flowing stream. Such conditions are most frequent during the fall at the beginning of the rainy season when stream flows are near their lowest annual levels. Besides the greases, oils, pesticides, litter, and organic matter associated with such runoff, heavy metals such as copper, zinc, and cadmium can cause considerable harm to aquatic organisms when introduced to streams in low flow conditions.

Surface water pollution is also caused by erosion. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

303(d) Impaired Water Bodies: Section 303(d) of the Federal Clean Water Act requires states to identify waters that do not meet water quality standards or objectives and, thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the states to establish water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

The Specific Plan Area does not include any water bodies listed on the Section 303(d) list of impaired water bodies.

The County of Contra Costa, CCCFCWCD, and the Cities of Antioch, Brentwood, and Oakley are member agencies of the Contra Costa Clean Water Program (CCCWP). The CCCWP was created in 1993 and also includes 18 other incorporated cities. The purpose of the CCCWP is to manage and protect the water quality of the stormwater runoff and creeks in Contra Costa County and in the member cities. The Central Valley Regional Water Quality Control Board issued National Pollution Discharge Elimination System (NPDES) Waste Discharge Requirements (Order R5-2010-0102, NPDES Permit No. CAS083313) to the CCCWP on September 23, 2010.

This Order requires implementation of Best Management Practices (BMPs) to reduce the level of pollutants in the stormwater to the maximum extent practicable. Some of the more important requirements are summarized below. Each of the members of the CCCWP are called permittees in the discussion below:

- The Permittees shall, within their respective jurisdictions, effectively prohibit the discharge of non-stormwater into storm drain systems and watercourses. It shall be prohibited to discharge rubbish, refuse, bark, sawdust, or other solid wastes into surface waters.

- Permittees shall use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques. The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating the stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as rain barrels and cisterns, green roofs, permeable pavement, preserving undeveloped open space, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.
- Each Permittee shall implement an industrial and commercial site control program at all sites which could reasonably be considered to cause or contribute to pollution of stormwater runoff, with inspections and effective follow-up and enforcement to abate actual or potential pollution sources.
- Permittees shall develop and implement an illicit discharge program that includes an active surveillance component and a centralized complaint collection and follow-up component to prevent illicit discharge into stormwater. Permittees shall maintain a complaint tracking and follow-up data system.
- Each Permittee shall implement a construction site inspection and control program at all construction sites.
- Through outreach programs, each Permittee shall increase the knowledge of residents regarding the impacts of stormwater pollution on receiving water and potential solutions to mitigate the problems change, the waste disposal and runoff pollution generation behavior of residents by encouraging implementation of appropriate solutions, and involve various citizens in mitigating the impacts of stormwater pollution.
- Prevent the impairment of urban streams by pesticide-related toxicity.
- Reduce trash loads from municipal stormwater systems by 40% by 2015, 70% by 2018, and 100% by 2023.
- Implement a Total Mercury and Methylmercury control program.

REFERENCES

CalWater, California Interagency Watershed Mapping Committee. 2008. California Watershed Boundary Dataset (WBD).

CCCCDP 2003, Contra Costa County Watershed Atlas, Prepared by the Contra Costa County Community Development Department, November 2003.

5.0 CONSERVATION AND NATURAL RESOURCES

Consolacion, 2013, Various CCCFCWCD flood control facility maps were provided by Mario Consolacion with the Contra Cost County Flood Control and Water Conservation District via email in January 2013.

5.7 AESTHETIC AND VISUAL RESOURCES

The City of Brentwood and the surrounding areas possess numerous scenic resources, many of which are found in the natural areas within the unincorporated areas of Contra Costa County. These resources enhance the quality of life for Brentwood residents, and provide for outdoor recreational, agricultural, and tourist-generating uses. Landscapes can be defined as a combination of four visual elements: landforms, water, vegetation, and man-made structures. Scenic resource quality is an assessment of the uniqueness or desirability of a visual element. This section reviews and summarizes Brentwood's key scenic resources.

METHODOLOGY

This section was prepared based on existing reports and literature for Brentwood. Additional sources of information included the California Department of Transportation's (Caltrans) Designated Scenic Route map for Contra Costa County.

KEY TERMS

Scenic Highway Corridor. The area outside of a highway right-of-way that is generally visible to persons traveling on the highway.

Scenic Highway/Scenic Route. A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest). The aesthetic values of scenic routes often are protected and enhanced by regulations governing the development of property or the placement of outdoor advertising. Until the mid-1980's, General Plans in California were required to include a Scenic Highways Element.

View Corridor. A view corridor is a highway, road, trail, or other linear feature that offers travelers a vista of scenic areas within a city or county.

REGULATORY SETTING

STATE

California Department of Transportation – California Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. A list of California's scenic highways and map showing their locations may be obtained from the Caltrans Scenic Highway Coordinators.

If a route is not included on a list of highways eligible for scenic highway designation in the Streets and Highways Code Section 263 et seq., it must be added before it can be considered for official designation. A highway may be designated scenic depending on the extent of the natural landscape that can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

When a local jurisdiction nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. A scenic corridor is the land generally adjacent to and visible from the highway. A scenic highway designation protects the scenic values of an area. Jurisdictional boundaries of the nominating agency are also considered, and the agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program.

To receive official designation, the local jurisdiction must follow the same process required for official designation of State Scenic Highways. The minimum requirements for scenic corridor protection include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising (including a ban on billboards);
- Careful attention to and control of earthmoving and landscaping; and
- Careful attention to design and appearance of structures and equipment.

LOCAL

City of Brentwood Urban Forest Guidelines

The City of Brentwood has developed the Urban Forest Guidelines to assist landscape architects, city planners, and designers to specify the types of trees to be planted in order to create a more beautiful and unified city. Homeowners can also benefit as they will be able to use these guidelines as a reference to make informed choices when planting trees.

Trees add scale and comfort to streets and their colors, shapes, and textures enhance the atmosphere and the identity of the city. The city's trees can be thought of as an "urban forest," and can be a diverse mixture of tree species. There are many growth characteristics and tree forms in street trees, and attention needs to be made to the trees chosen for individual projects. Street trees will grow for many years, and they must be properly placed and intelligently managed to maximize effects and minimize problems.

City of Brentwood Commercial and Industrial Design Guidelines

The planning and design guidelines contained in the Brentwood Commercial and Industrial Design Guidelines apply to any nonresidential use and/or building structure in any zone within the City of Brentwood. They are in addition to the Design and Site Development Review requirements contained in Brentwood Municipal Code Section 17.820.

Because of their special characteristics, additional specific design guidelines are provided for the following:

- Downtown Brentwood
- Highway 4 Delta Expressway
- Public and Institutional Buildings

City of Brentwood Municipal Code, Chapter 17.820: Design and Site Development Review

The purpose of these regulations is to allow design and site development review of all developments, signs, buildings, structures, and other facilities constructed or modified in any zone where design and site development review is required, in order thereby to foster a good design character through consideration of aesthetic and functional relationships to surrounding development, and in order to further enhance the city's appearance, and the livability and usefulness of properties.

City of Brentwood General Plan

The City's General Plan contains the following goals and policies related to visual resources:

Conservation and Open Space Element

GOAL COS 1: Ensure the provision and preservation of diverse and accessible open spaces throughout the Brentwood Planning Area.

Policy COS 1-1: General Plan land use designations that include agriculture, permanent open space, parks, and similar uses, as well as waterways (i.e., Marsh Creek, Dry Creek, Deer Creek, and Sand Creek), shall be considered open space.

Policy COS 1-2: Preserve open space for conservation, recreation, and agricultural uses.

Policy COS 1-4: Where possible, integrate open space and stream corridors with trails and other recreational open space in an environmentally sustainable manner.

Policy COS 1-5: Recognize urban open space as essential to maintaining a high quality of life within the city limits of Brentwood.

Policy COS 1-6: Support regional and local natural resource preservation plans of public agencies that retain and protect open space within the city limits, the Sphere of Influence, and the Planning Area.

Policy COS 1-7: Encourage public and private efforts to preserve open space.

Policy COS 1-8: Common or private open space that is not City property shall be privately maintained.

Policy COS 1-9: Encourage the protection and incorporation of existing, native, mature, non-orchard trees and areas of natural vegetation as part of new development.

Action COS 1a: Review all development proposals involving unincorporated land within the jurisdiction of Contra Costa County, and within or adjacent to the Sphere of Influence or Planning Area, to ensure adequate preservation of community separators and open space resources.

Action COS 1b: Adopt an ordinance that specifies standards and responsibilities for the maintenance of private open space lands within the city limits. The standards should include provisions for public access, habitat management, water quality protection, safety, and aesthetics.

Action COS 1c: Implement a coordinated and cost-effective plan for City management and maintenance of publicly-owned open space within the city limits.

GOAL COS 7: Protect hillsides and ridgelines from visual impacts and erosion.

Policy COS 7-1: Protect Brentwood’s ridgelines (hilltops and steep hillsides) from erosion, slope failure, and development.

Policy COS 7-2: Preserve the topography of Brentwood’s hills by discouraging unnecessary leveling/grading activities prior to site-building on hillsides where development is permitted.

Policy COS 7-3: Preserve and protect prominent community views of scenic resources, including Mount Diablo, local hills and ridgelines, and open space areas surrounding Brentwood, and consider community visual access and view corridors when reviewing development proposals.

Policy COS 7-4: Discourage development on hillsides and ridgelines where structures would interrupt the skyline.

Action COS 7a: Require assessment of critical public views and ridgelines as part of the project review process in order to ensure that projects protect natural resources through proper site planning, building design, and landscaping.

Action COS 7b: Develop and adopt a hillside grading and development ordinance. The ordinance should include standards for slope stability, building heights, lot coverage, ridgeline and site line protection, drainage, revegetation, erosion control, emergency vehicle access, and other standards determined to be applicable by the City.

Land Use Element

GOAL LU 6: Maintain and enhance the visual quality of Brentwood by promoting the highest standards of architecture and site design for all development projects, both public and private.

Policy LU 6-1: Create residential areas in Brentwood that include innovative designs which are linked with bikeways and pedestrian trails, commercial and employment centers, and transit stops.

Policy LU 6-2: Maintain the character of existing neighborhoods by ensuring new development is compatible in style, size, color, and footprint with the existing residences in the neighborhood.

Policy LU 6-3: 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 and provide visible functional centers.

Policy LU 6-4: Apply design standards regulating setbacks, landscaping, screening, and architectural style to new residential development and rehabilitation projects.

Policy LU 6-5: Ensure that the development of business parks includes orderly land planning, high quality architectural and landscape design, integrated communication and technology infrastructure, building flexibility, and diverse amenities and environmental controls.

Policy LU 6-6: Encourage quality landscape and design.

Action LU 6a: Implement the Commercial and Industrial Design Guidelines and Residential Design Guidelines during the review and permitting of all new development projects.

Action LU 6b: Update the Municipal Code and the Commercial and Industrial Design Guidelines for non-residential uses to include standards that promote attractive and sustainable development for commercial, industrial, office, institutional, and other non-residential uses and that address the following provisions:

1. Site planning sensitive to the natural environment and that addresses creating functional and attractive places;
2. Criteria to ensure outdoor lighting, trash receptacles, fencing, and seating space are carefully considered as integral elements of the landscape;
3. Landscaping should utilize plant materials in a logical and orderly manner to define spatial organization, relate buildings and other structures, incorporate various site elements, promote consistency throughout the development, and be scaled to site structures;
4. Require separate vehicle access, pedestrian pathways, and secured bicycle parking within the internal site plan of new commercial, office, mixed use, and public facility developments;
5. Criteria for screening rooftop and ground level mechanical equipment (e.g. satellite TV dishes, telephone and electrical boxes, heating, cooling, and ventilating systems, and trash sites, etc.) from public view, unless prohibited by the utility provider;
6. Standards for building design, architecture, and placement that incorporates a pedestrian scale with frontages oriented toward the street front or public gathering areas, varied articulated facades, windows and building features, reduced or zero setbacks where appropriate; and community design features, such as landscaping, entry features, fountains, plazas, pedestrian furniture, and similar features;
7. Requirements for larger projects to include community design and gathering features, such as entry features, outdoor benches, art, plazas, seating areas, fountains, etc.;
8. Minimize vehicular, bicycle, and pedestrian conflicts; and
9. Maximize access to commercial uses, recreational uses, employment, public services, and other destinations using a minimum of pavement.

Action LU 6c: Periodically review and update the Residential Design Guidelines and the Commercial and Industrial Design Guidelines to ensure high quality design throughout Brentwood.

5.0 CONSERVATION AND NATURAL RESOURCES

Action LU 6e: Create streetscape and landscaping design standards that will help enhance the character and create a sense of identity for new development within Brentwood, while promoting the use of native and drought-tolerant plant and tree species.

Action LU 6f: Implement the Brentwood Urban Forest Guidelines to provide for an attractive and healthy mix of street trees and urban landscaping throughout the city.

Action LU 6g: Use assessment districts, homeowners' associations, and similar programs to install and maintain street trees, landscaping, fencing, landscaped sound walls, and other rights of way improvements.

ENVIRONMENTAL SETTING

The City of Brentwood is located in the eastern valley area of Contra Costa County, immediately east of the Diablo Range. The city has historically been surrounded by agricultural land uses, consisting primarily of row crops, orchards, and grazing land. The topography of the city 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 and the gently rolling hills rising out of west of the city, which are characterized by grassy, tree-studded hills, represent the most visually prominent natural features surrounding the city. The Specific Plan Area, located along the western portion of the City of Brentwood, is located very close to these features.

A significant visual feature outside the Specific Plan 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.

Lone Tree Valley, Horse Valley, Deer Valley, and Briones Valley form a set of drainage basins which collect seasonal rainfall and direct runoff into a network of small creeks in the Brentwood area. Marsh Creek is the largest of the waterways within the city, and has been dammed in the southern portion of the city to create the Marsh Creek Reservoir. Marsh Creek continues north from the reservoir, collecting water from Sand Creek, Deer Creek, and Dry Creek. Sand Creek is located along the southern edge of the Specific Plan Area. Marsh Creek eventually converges with the San Joaquin River, north of the Specific Plan Area.

Riparian vegetation generally represents a valuable scenic resource within any area. However, much of the naturally occurring riparian vegetation along the creeks in the City of Brentwood has been reduced or eliminated due to flood control measures or agricultural encroachment in the past. The most well-developed riparian communities are found along Marsh Creek, south of its confluence with Dry Creek, and along Sand Creek, east of Fairview Avenue.

Expanses of agricultural lands surrounding the City of Brentwood define the visual character of portions of the city. Large open fields dominate particular areas of the city. The open space creates a visual contrast between Brentwood's rural heritage and the numerous suburban land uses that have emerged during the past decades, including single-family homes and retail, office, and light industrial developments.

The Specific Plan Area currently encompasses an area that includes agricultural and commercial land uses. The Specific Plan Area borders a portion of the western edge of the city, adjacent to open space and agricultural areas. From a visual standpoint, the Specific Plan Area is located in a part of the City of

Brentwood that has wide-ranging views of the surrounding terrain, including agricultural lands, and the hilly terrain that rises from the west.

Scenic Highways and Corridors

According to the California Scenic Highway Mapping System, administered by Caltrans, there are no officially designated State Scenic Highways in the vicinity of the City of Brentwood. There are two officially designated scenic highway corridors in Contra Costa County: Interstate 680, from the Alameda County line to the junction with State Route 24; and State Route 24 from the east portal of the Caldecott tunnel to Interstate 680 near Walnut Creek. Neither of these officially designated scenic highway corridors provide views of Brentwood or the immediate surrounding areas.

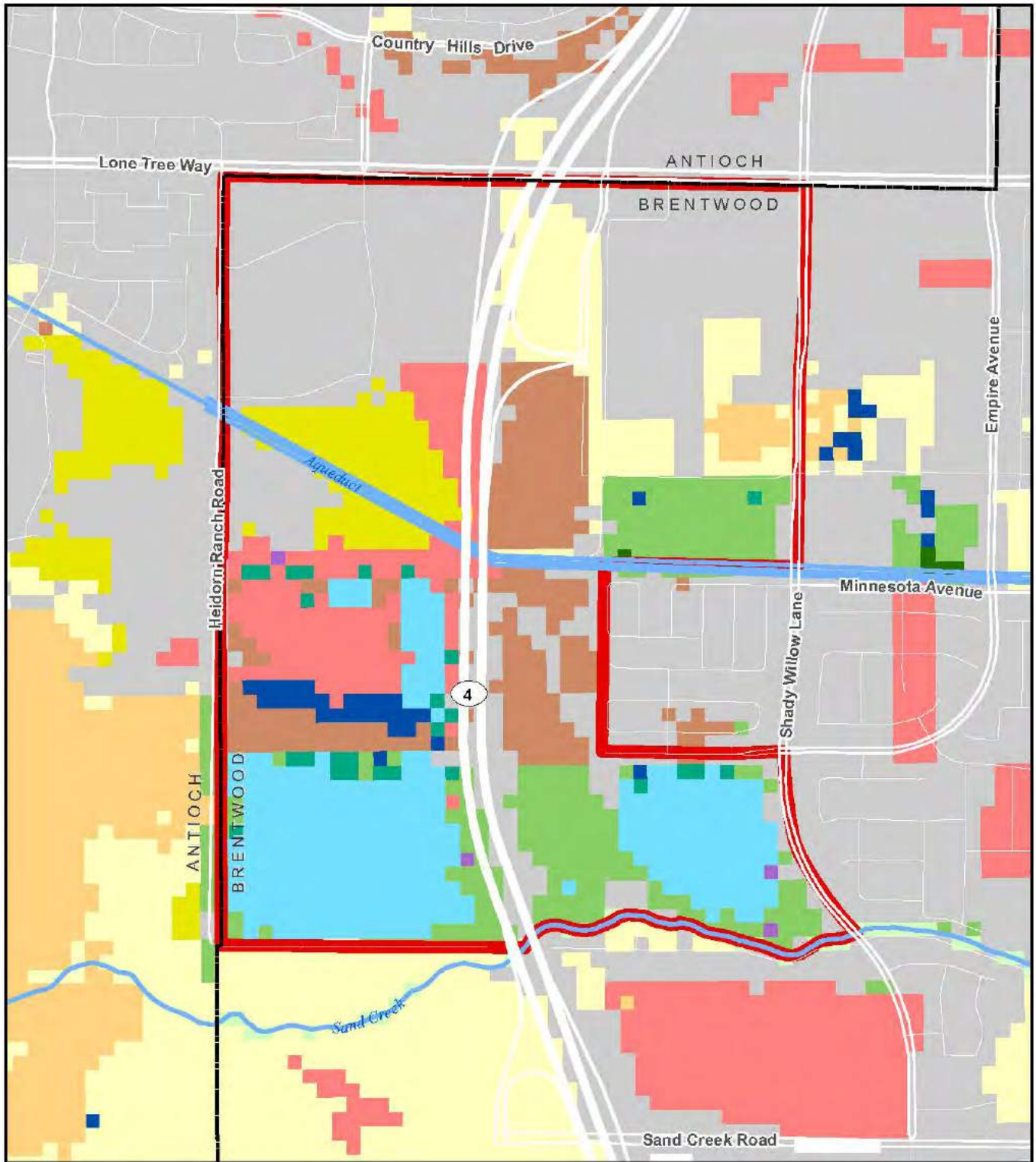
There is, however, one Eligible State Scenic Highway Corridor within and adjacent to Brentwood that has not yet been officially designated. State Route 4, west of the junction with Byron Highway to the junction with State Route 160 in Antioch is designated as an Eligible State Scenic Highway Corridor. A portion of this section of State Route 4 is located within the Specific Plan Area.

Locally identified scenic routes within the City of Brentwood include State Route 4, Camino Diablo Road, Marsh Creek Road, Walnut Boulevard, Deer Valley Road, and Lone Tree Way, as identified in the City of Brentwood 2001 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.

REFERENCES

California Department of Transportation. 2013. State Scenic Highway Program. Available: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/

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Legend

Priority Area 1

WHR Cover Type

Annual Grassland

Barren

Cropland

Deciduous Orchard

Dryland Grain Crops

Evergreen Orchard

Irrigated Grain Crops

Irrigated Hayfield

Irrigated Row and Field Crops

Pasture

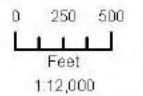
Urban

Valley Foothill Riparian

Vineyard

PRIORITY AREA 1 SPECIFIC PLAN

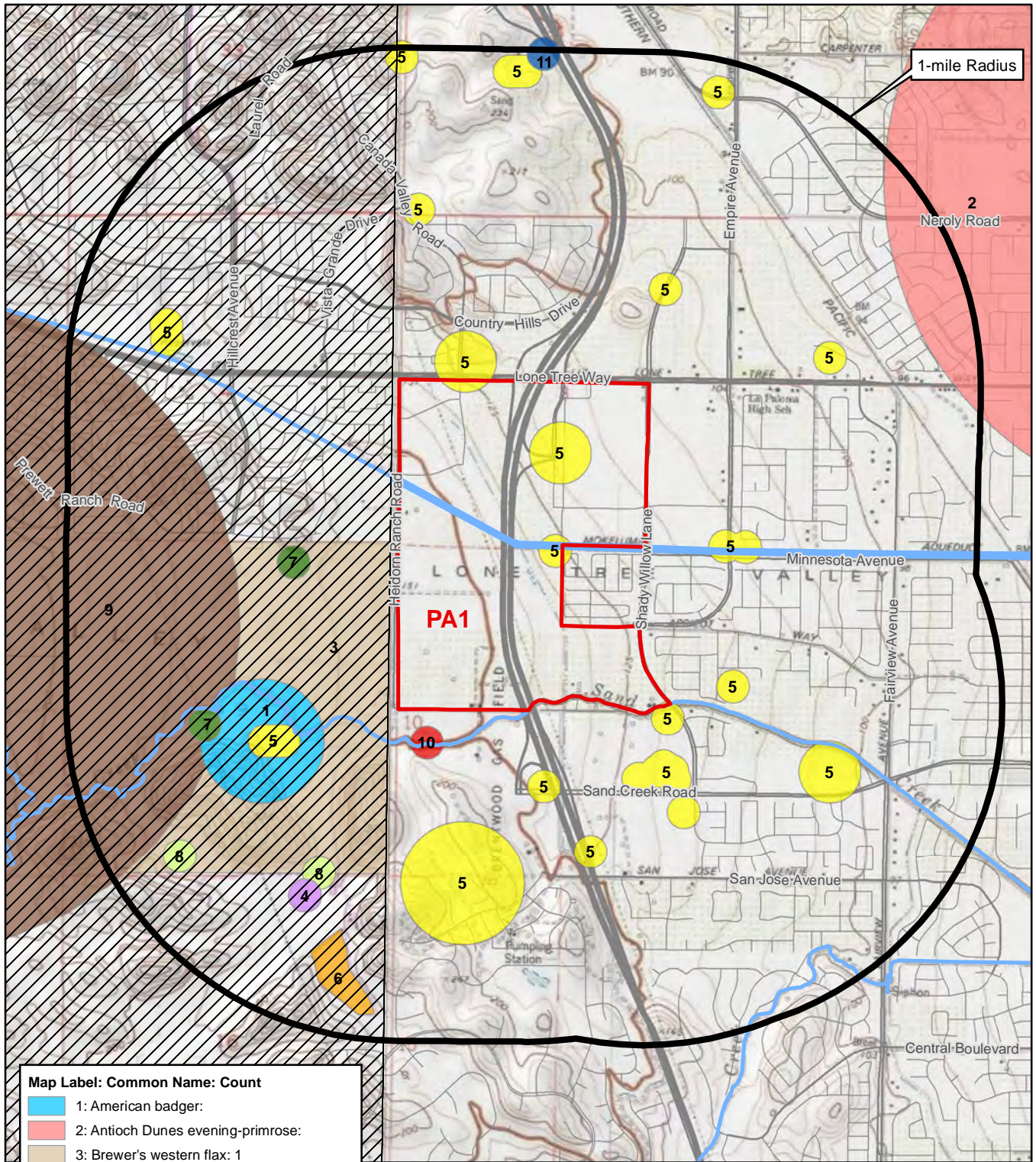
Figure 5.2-1: Cover Type



Sources: FRAP Vegetation (FY2015-17); Contra Costa County GIS; USGS National Hydrography Dataset (NHD); Map date: October 12, 2016.



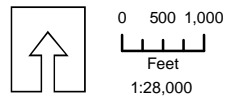
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Map Label	Common Name	Count
Light Blue	1: American badger:	1
Light Red	2: Antioch Dunes evening-primrose:	1
Light Brown	3: Brewer's western flax: 1	1
Light Purple	4: brittlescale: 1	1
Yellow	5: burrowing owl: 16	16
Light Orange	6: California tiger salamander: 1	1
Light Green	7: round-leaved filaree: 2	2
Light Yellow-Green	8: San Joaquin spearscale: 2	2
Light Brown	9: showy golden madia: 1	1
Red	10: Swainson's hawk: 1	1
Blue	11: white-tailed kite: 1	1
Hatched	Sensitive Environmental Occurrence (Alameda Whipsnake)	

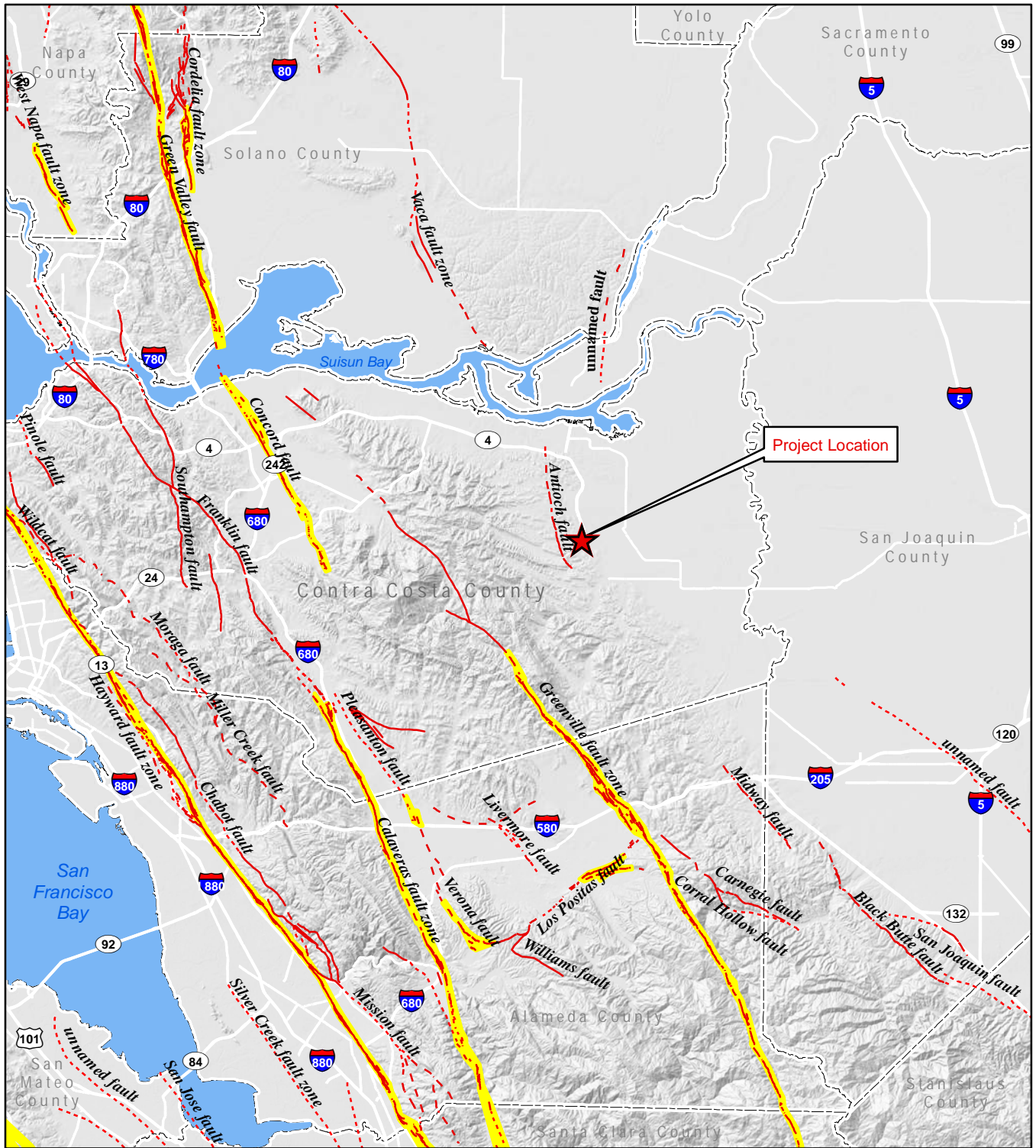
PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.2-2: California Natural Diversity Database
1-mile Radius Search



Sources: CNDDB 10/4/2016; OpenStreets; Arc GIS Online USGS Topographic Map Service; USGS National Hydrography Dataset (NHD); Map date: October 12, 2016.

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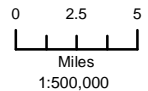


PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.4-1. Earthquake Faults and Alquist-Priolo Zones

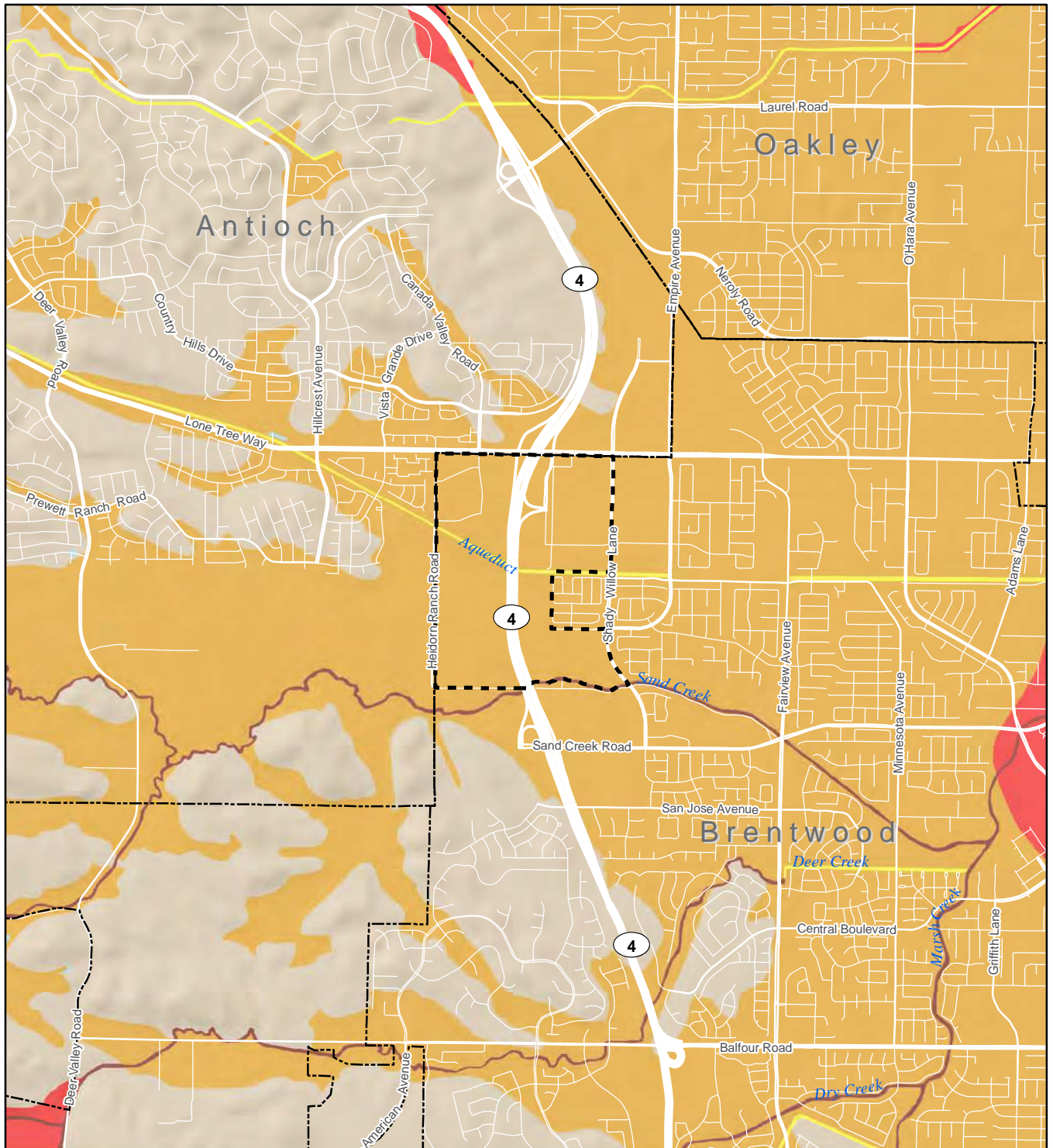
Quaternary Faults

- Well-constrained
- - - Moderately-constrained
- . . . Inferred
- Alquist-Priolo Fault Zones



Data sources: US Geologic Survey; CalAtlas; OpenStreet Data. Map date: October 26, 2016.

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Legend

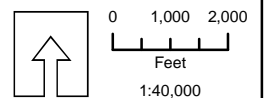
Priority Area 1

Liquefaction Susceptibility

- VL - Very Low
- L - Low
- M - Medium
- H - High
- VH - Very High
- W - Water

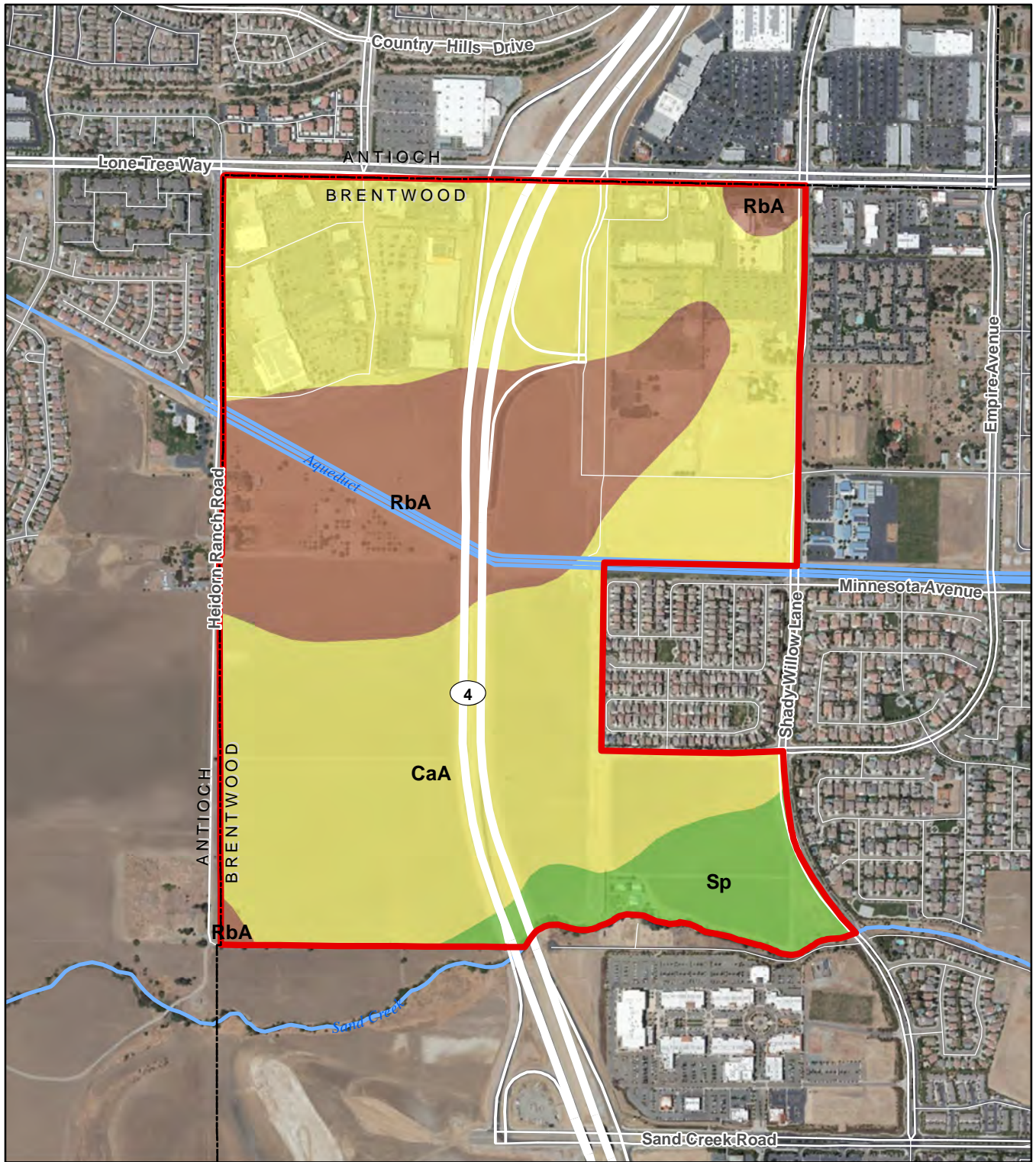
PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.4-2: Liquefaction Potential



Sources: Association of Bay Area Governments Resilience Program, Earthquake Basics; USGS National Hydrography Dataset (NHD); OpenStreetMap; CalAtlas. Map date: November 3, 2016.

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Legend

- Priority Area
- City Boundary

NRCS Soil Description

- CaA: Capay clay, 0-2% slopes (282.97 ac)
- RbA: Rincon clay loam, 0-2% slopes, MLRA 14 (116.32 ac)
- Sp: Sycamore silty clay loam, clay substratum (31.97 ac)

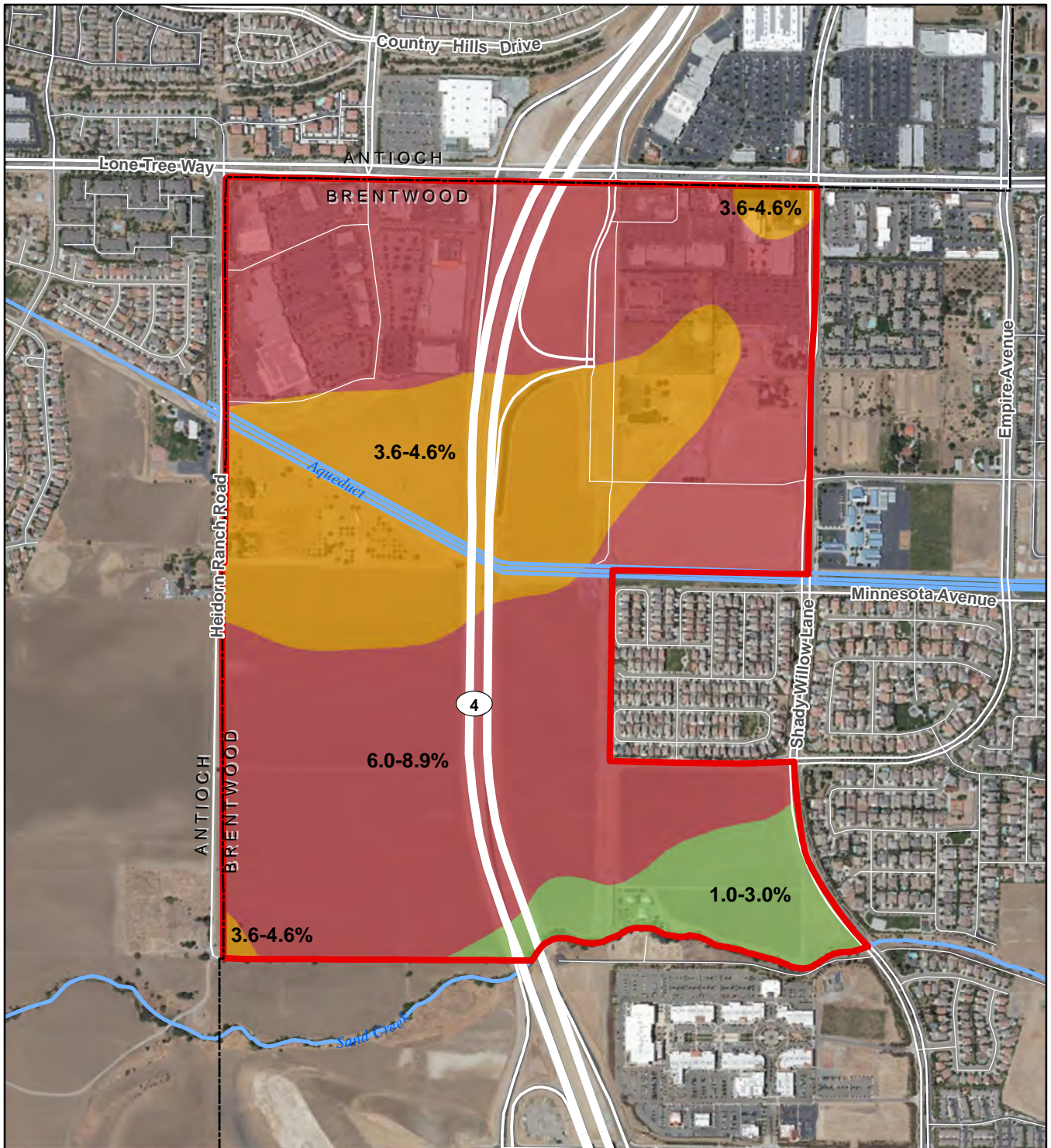
PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.4-3: Soil Map



Sources: NRCS Web Soil Survey, Contra Costa County (CA013), Survey Area Version 12, Tabular Version 4, Spatial Version 4, Contra Costa County GIS; USGS National Hydrography Dataset (NHD); ArcGIS Online Aerial Imagery Service. Map date: October 12, 2016.




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Legend

-  Priority Area
-  City Boundary

Shrink-Swell Potential*

-  Low
-  Moderate
-  High

*Shrink-Swell Potential is determined by linear extensibility. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Soils are considered to have low potential when the linear extensibility is less than 3%, moderate if 3-6%, and high if 6-9%.

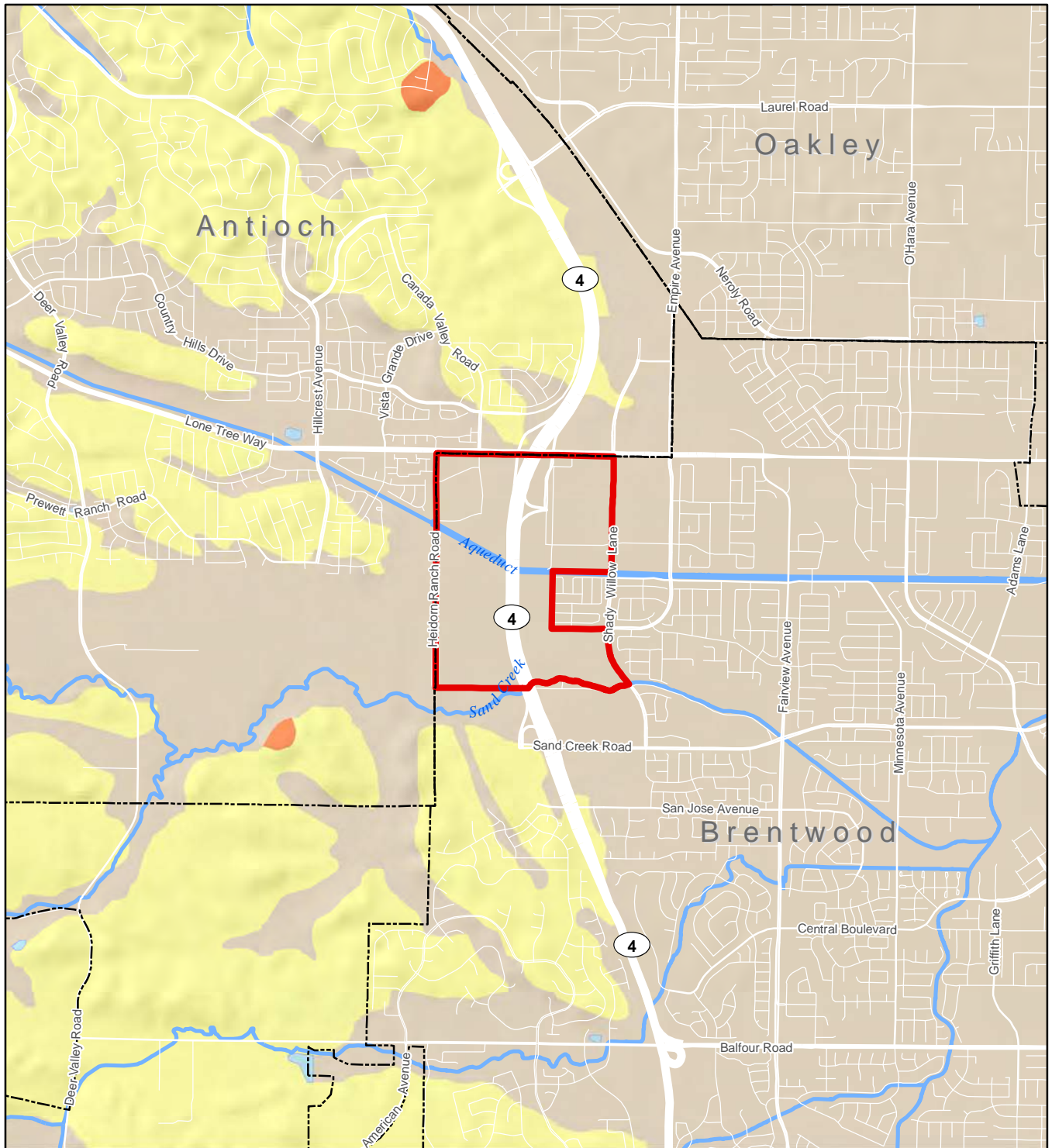
Sources: NRCS Web Soil Survey, Contra Costa County (CA013), Survey Area Version 12, Tabular Version 10, Spatial Version 4, Contra Costa County GIS; USGS National Hydrography Dataset (NHD); ArcGIS Online Aerial Imagery Service. Map date: October 27, 2016.

PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.4-4: Shrink-Swell Potential of Soils



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Legend

Priority Area 1

Distribution of Landslides/Landslide Potential*

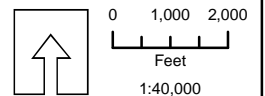
- surficial deposits/little or no potential
- few landslides/low potential
- mostly landslide/high potential
- water

** the best available predictor of where movement of slides and earth flows might occur is the distribution of past movements. Future movement is most likely to occur within and around the places they have previously occurred.*

Sources: USGS Open File Report 97-745c "Summary Distribution of Slides and Earthflows in the San Francisco Bay Region, California;" Contra Costa County; USGS National Hydrography Dataset (NHD); OpenStreetMap; CalAtlas. Map date: November 3, 2016.

PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.4-5: Landslide Potential



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Legend

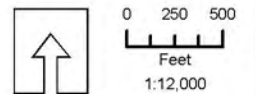
- Priority Area 1
- City Boundary

Well Description

- Plugged Dry Gas
- Plugged Dry Hole
- Plugged Oil and Gas

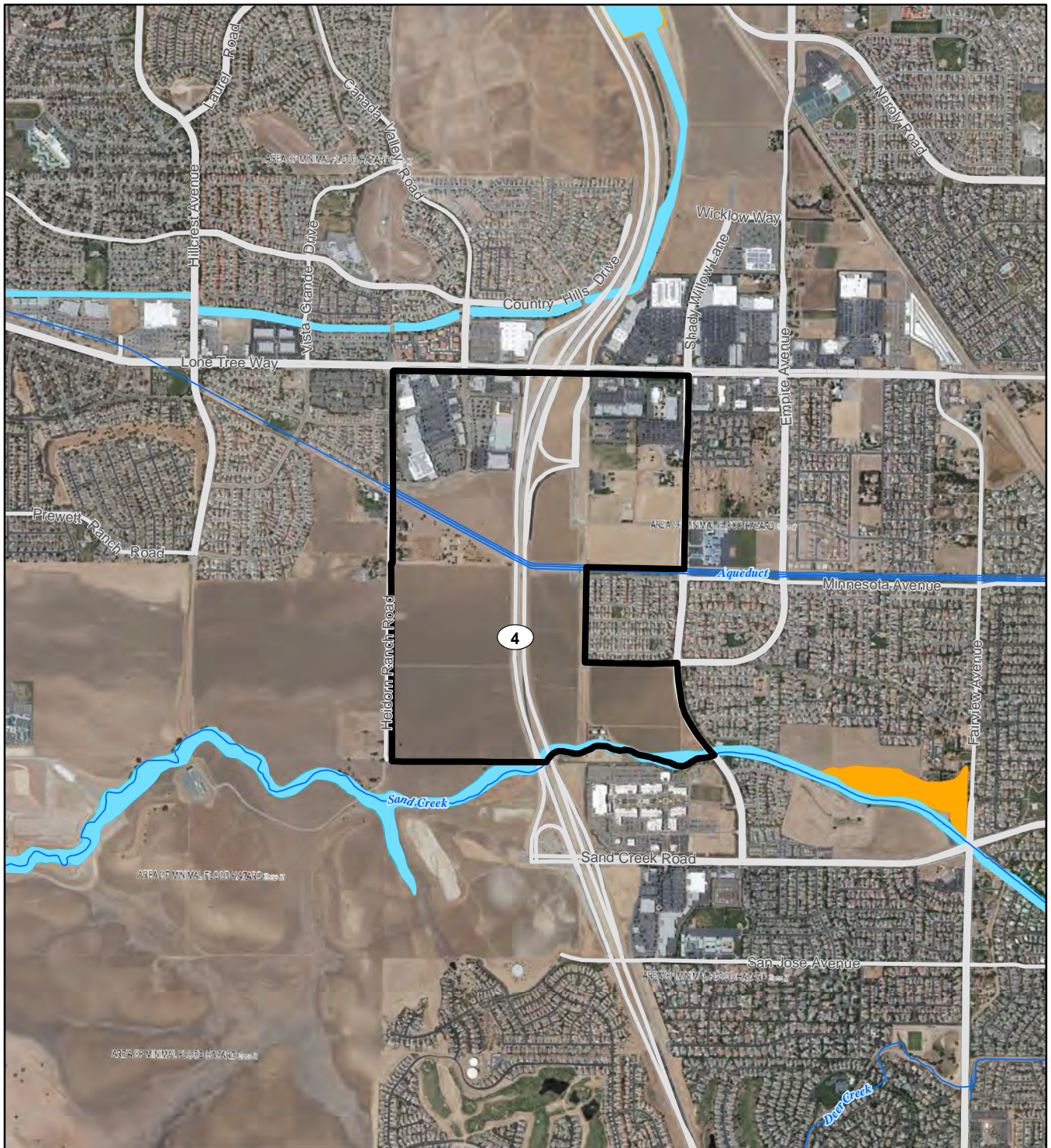
PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.5-1: Active and Plugged Wells



Sources: California Division of Oil, Gas and Geothermal Resources, July 8, 2016; Contra Costa County GIS; USGS National Hydrography Dataset (NHD); ArcGIS Online Aerial Imagery Service. Map date: October 27, 2016.

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PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.6-1: FEMA Flood Zone Designations


Legend

 Priority Area 1

FEMA Designation

-  1% Annual Chance Flood Hazard (100-yr Flood Zone)
-  0.2% Annual Chance Flood Hazard (500-yr Flood Zone)

USGS Water Features

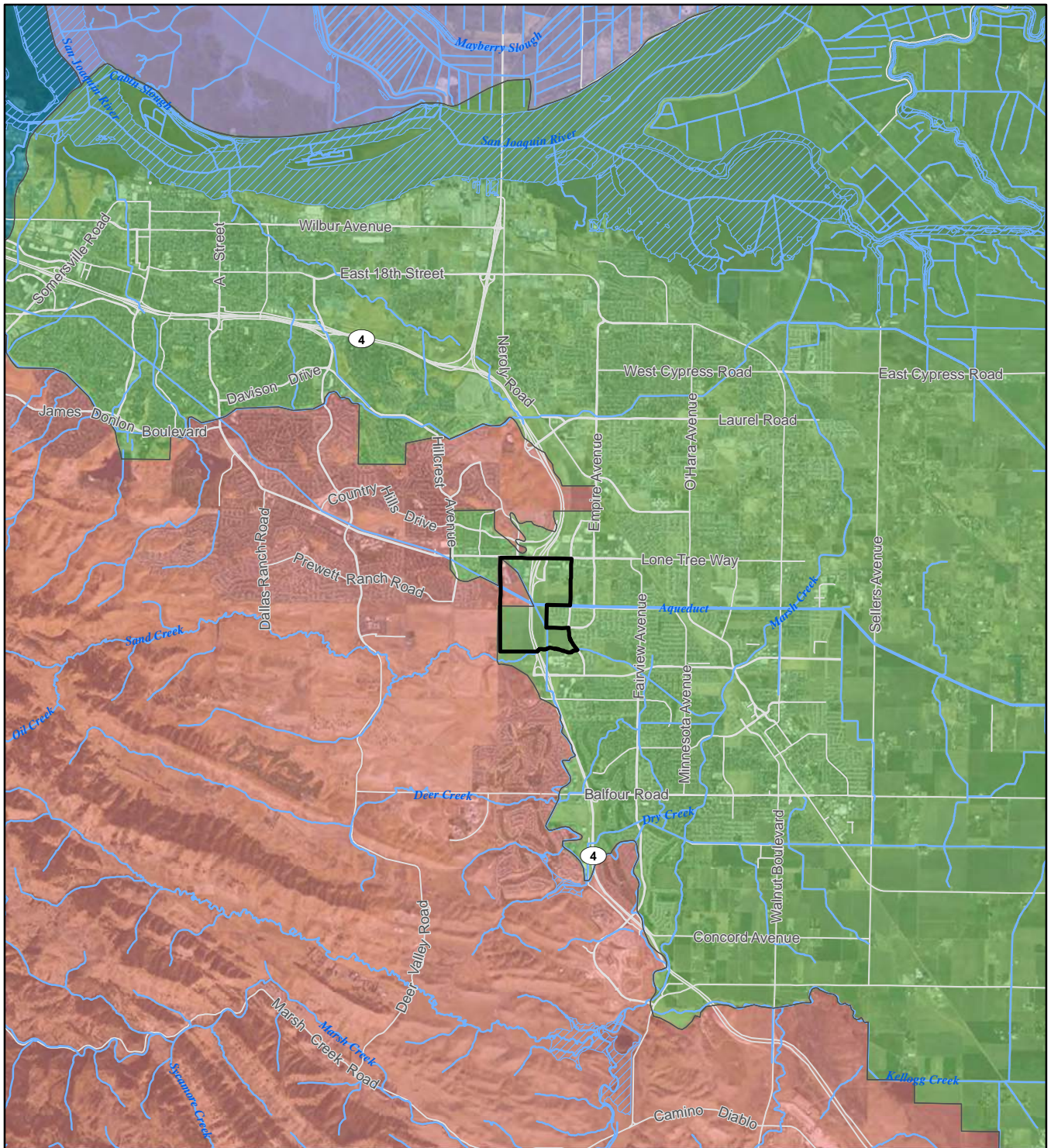
 Stream/River/Canal



0 500 1,000
Feet
1:24,000

Sources: FEMA's National Flood Hazard Layer (Official), accessed November 7, 2016 ; USGS National Hydrography Dataset; ArcGIS Online Imagery Service; Open StreetMap; Contra Costa County. Map date: November 7, 2016.

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Legend

Priority Area 1

Hydrologic Unit

North Diablo Range

Sacramento Delta

San Joaquin Delta

Suisun

USGS Water Features

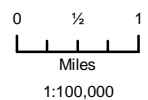
Stream/River/Canal

River Areas

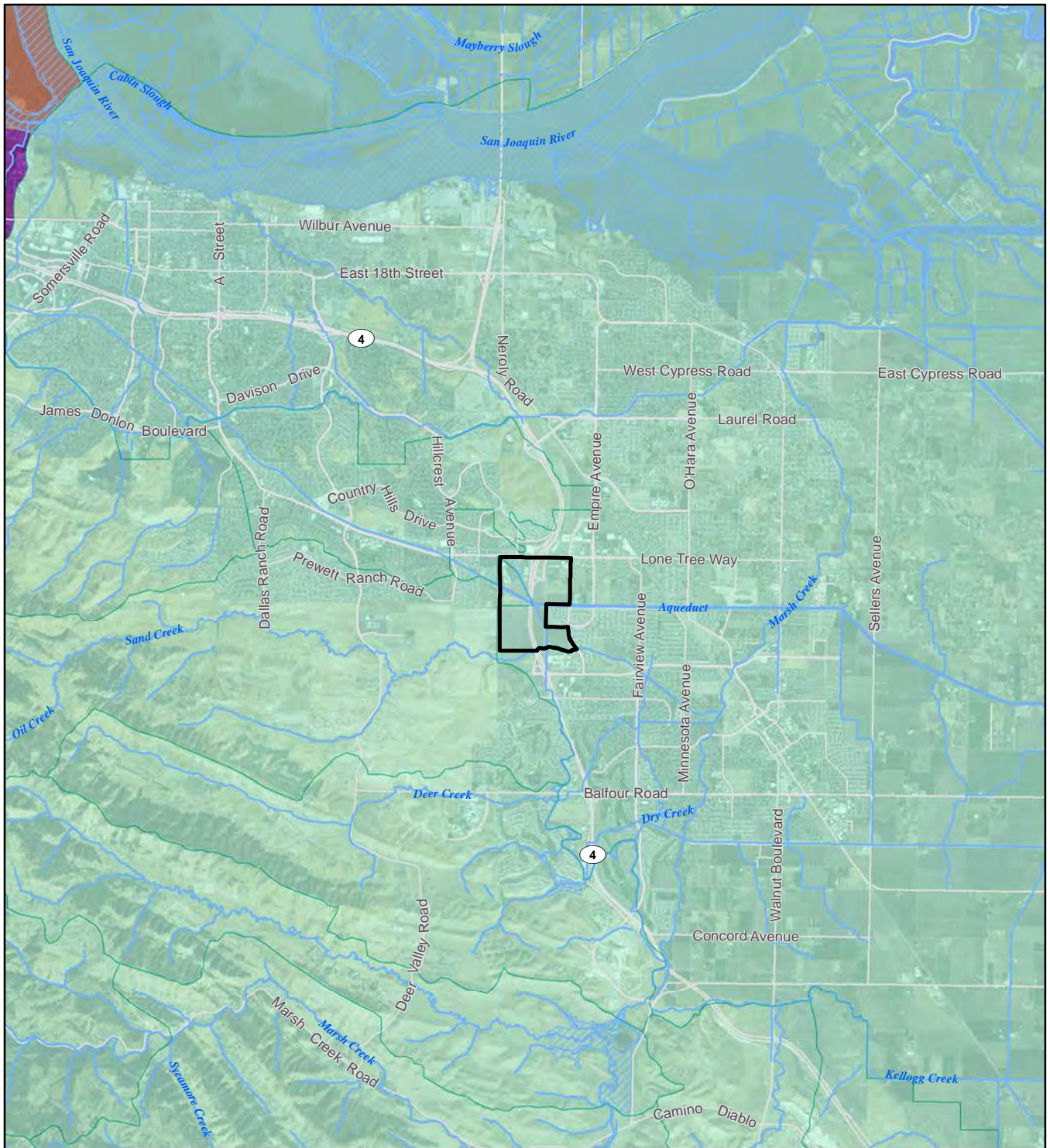
Sources: Calwater 2.2.1, CDF-FRAP; USGS National Hydrography Dataset; ArcGIS Online Imagery Service; Contra Costa County, Open StreetMap. Map date: November 7, 2016.

PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.6-2: Hydrologic Units




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Legend

 Priority Area 1


USGS Water Features


 Stream/River/Canal

 River Areas

Hydrologic Area Name

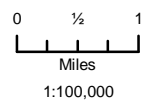
 Concord

 Suisun Bay - in Delta

 undefined

PRIORITY AREA 1 SPECIFIC PLAN

Figure 5.6-3: Hydrologic Areas



Sources: Calwater 2.2.1, CDF-FRAP; USGS National Hydrography Dataset; ArcGIS Online Imagery Service; Contra Costa County; Open StreetMap. Map date: November 7, 2016.

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