DRAFT ENVIRONMENTAL IMPACT REPORT

HILLCREST STATION AREA SPECIFIC PLAN

CITY OF ANTIOCH

STATE CLEARINGHOUSE NO. 2008052128 JANUARY 2009

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Executive Summary

This Draft Environmental Impact Report (EIR) evaluates the potential environmental impacts of the proposed Hillcrest Station Areas Specific Plan (proposed Plan). The City of Antioch is the "lead agency" for this EIR, as defined by the California Environmental Quality Act (CEQA). As the lead agency, the City is required to evaluate the potential effects of the Plan in an EIR.

An EIR is intended to inform decision-makers and the general public of the potential significant environmental impacts of a proposed project. This EIR is a program EIR that examines the potential effects resulting from implementing designated land uses and policies in the proposed Plan. The impact assessment evaluates the Specific Plan as a whole and identifies the broad, regional effects that may occur with its implementation. As a programmatic document, this EIR does not assess site-specific impacts. Any future development project made possible by the Specific Plan will be subject to individual, site-specific environmental review, as required by State law.

This EIR identifies the proposed Plan policies that minimize potentially significant impacts. The EIR also evaluates reasonable alternatives to the proposed project that may reduce or avoid one or more significant environmental effects and would feasibly attain most of the basic objectives. These alternatives include a "No Project" alternative that represents the result of not implementing the project (CEQA Guidelines 15126.6(a)) Based on the alternatives analysis, an environmentally superior alternative is identified.

E.1 PROPOSED PROJECT

The proposed Hillcrest Station Area Specific Plan consists of policies and proposals to guide the future growth within the Hillcrest Station Area, referred to in this document as the Planning Area (see Chapter 2: Project Description for discussion and map). The project includes the Hillcrest Station Area Specific Plan, as well as the subsequent actions needed to implement the Plan and make it consistent with existing plans and regulations. The City will adopt an amendment to the Antioch General Plan concurrently with adoption of the proposed Plan. The General Plan amendment will include changes to the Land Use and Circulation Elements. Implementation of the proposed Plan will also include, but is not limited to, such tasks as amending the City of Antioch Zoning Ordinance and Map, updating the City's Capital Improvements Program (CIP), and establishing development impact fees.

PLAN OBJECTIVES

The Planning Area presents a tremendous opportunity for high quality, transit-oriented development with great visibility from two freeways. The proposed Plan presents a strategy for creating a mixed-use community that includes high-density housing, new office and commercial development, and a well-planned, linked circulation and infrastructure backbone. The area can be transformed into a signature area of Antioch, with high quality development and interesting pedestrian areas that add to the City's quality of life. The key objectives of the Hillcrest Station Area Specific Plan are to:

Land Use and Development

- Establish a signature area of Antioch with high quality development and dynamic pedestrian areas that add to the quality of life of the city.
- Designate sites for new employment uses that add quality jobs and improve the City's job/housing balance. Accommodate at least 5,000 jobs in order to create a sub-regional employment center.
- Create a transit village residential neighborhood, with a variety of high-density housing types within walking and bicycling distance of the transit station.
- Designate sites for retail uses that can take advantage of the freeway visibility and access.

Circulation

- Generate transit ridership to support the public investment in eBART.
- Construct roads to serve new development.
- Minimize impacts on regional highway facilities and on surrounding residential neighborhoods.
- Enhance multi-modal access and connectivity for pedestrians, bicyclists, automobile drivers, bus, and eBART passengers.

Environmental Protection

- Provide appropriate protection for wildlife habitat, biological resources, and other sensitive natural features of the Hillcrest Station Area.
- Ensure that land uses and circulation routes are compatible with the surrounding neighborhoods.
- Ensure that sensitive receptors such as homes and schools are adequately protected from noise and air emissions.

Infrastructure and Financing

- Establish infrastructure for roads, water, sewer, storm drainage, utilities, and other systems needed to support development.
- Establish parks, trails, and other community facilities necessary to serve future development.
- Establish financing mechanisms to pay for the infrastructure and services required to support development.
- Ensure that the revenues generated from the area and the expenses to provide services do not adversely affect the fiscal stability of the City.

E.2 PROJECTED SPECIFIC PLAN BUILDOUT

Full development under the proposed Plan is referred to as "buildout." Although the proposed Plan applies until the 2035 planning horizon, the Plan is not intended to specify or anticipate when buildout will actually occur; nor does the designation of a site for a certain land use necessarily mean the site will be built with that use until 2035. The Specific Plan creates a land use and regulatory framework that allows up to 2,500 residential units and 2.5 million square feet of commercial uses in the Station Area. The Plan framework defines three development areas which will be subject to master plans. The western portion of the Station Area is a transit village designed around the eBART station. The eastern portion of the Station Area is planned as a mixed-use town center around the future Phillips Lane Interchange; it could also include a second eBART station located adjacent to the Union Pacific Railroad right-of-way (UP ROW). The area between SR 4 and the UP ROW in the western portion of the Station Area has a more auto-oriented character, and is referred to as the "Freeway Area." Refer to the Project Description in Chapter 2 for more detailed analysis of Plan buildout.

HOUSING AND POPULATION GROWTH

Buildout projections include a maximum of 2,500 residential units, which is the maximum allowed under the Station Area Plan policies. The majority of the housing will be in multi-unit structures, some of which will be in mixed-use buildings.

Table E-1 Buildout Projections: Housing Units and Population

	Multi-family Units [1]	*Population* [2]
Transit Village	1,000	2,000
Town Center	1,500	3,000
Total	**2,500**	**5,000**

Source: Dyett and Bhatia, 2008.

COMMERCIAL AREA AND EMPLOYMENT GROWTH

The land use designations support up to 2.5 million square feet of commercial uses with approximately 5,600 new jobs based on the buildout projections. Up to 1.2 million square feet of office space may be built in the Station Area, most of which is designated in the Transit Village area. Up to 1.0 million square feet of retail space is projected at buildout of the Station Area. The majority of the retail space is anticipated to be built in the Town Center area.

Table E-2 Buildout Projections: Commercial Square Footage and Jobs

	Office SF	*Retail SF*	*Hotel Rooms*	*Jobs* [1]
Transit Village	730,000	120,000	-	2,300
Town Center	300,000	730,000	325	2,500
Freeway Area	170,000	150,000	-	800
Total	**1,200,000**	**1,000,000**	**325**	**5,600**

Source: Dyett and Bhatia, 2008.

E.3 REGIONAL PLAN CONSISTENCY

BART SYSTEM EXPANSION POLICY

BART adopted a System Expansion Policy in 1999. The eBART project is the first application of the BART policy. The policy requires that BART set Ridership Targets (Thresholds) for the eBART service in the Pittsburgh to Antioch Corridor, which has been defined as a total of 5,801 patron entries and exits for an average weekday in 2030. As a "terminal" station, the Hillcrest Station is projected to serve many commuters from East Contra Costa County. Based on standard modeling methodology that incorporates assumptions regarding land use and transportation policies (including draft Ridership Development Plans), and projected growth, BART estimates that in 2030 there will be 10,100 total daily riders. The Hillcrest Station is projected to serve more than 80 percent of the riders (8,200). Thus, the eBART service should far exceed BART ridership targets. (East Contra Costa County BART Extension Draft EIR, September 2008)

MTC TRANSIT-ORIENTED DEVELOPMENT GOALS

The Metropolitan Transportation Commission (MTC) adopted a Transit-Oriented Development (TOD) Policy in 2005. Resolution 3434 specifies that by 2030, a total of 6,600 existing and new units must be located within a half-mile of the three stations on the eBART corridor. Table E-3 illustrates the number of projected corridor housing units, assuming that the Railroad Avenue Specific Plan is adopted by the City of Pittsburg without significant reductions in proposed densities. The estimated 10,403 units far exceed the minimum 6,600 units required.

Table E-3 Existing and Planned Corridor Housing

	Existing [1]	*Planned*	*Total*
Pittsburg/Bay Point	1,873	1,595	3,468
Railroad Avenue	1,477	1,590	3,067
Hillcrest Median	999	1,000	1,999
Subtotal	**4,349**	**4,185**	**8,534**
Future Phillips Station	369	1,500	1,869
Total	**4,718**	**5,685**	**10,403**

Source: eBART Draft EIR, 2008; ABAG Projections 2005; Pittsburg/Bay Point Specific Plan, 1997; Draft Railroad Avenue Specific Plan, 2008.

E.4 ALTERNATIVES TO THE PROPOSED PLAN

Two alternative development scenarios are evaluated in this EIR. The Alternative Plan is based on BART's proposed project. The No Project scenario is based on the Antioch 2003 General Plan Update, which represents the continuation of the existing plans and policies if the proposed Plan is not adopted. Table E-4 summarizes the buildout of the proposed plan, the Alternative Plan and the No Project scenario. The Northside East Station Plan was evaluated but found to be infeasible due to the location of the only eBART station outside of the SR 4 median.

Table E-4 Buildout of Alternatives

	Proposed Plan	*Alternative Plan*	*No Project*
Residential Units	2,500	650	1,200
Population	5,000	1,680	2,400
Office Area (sf)	1,200,000	630,000	3,000,000
Retail Area (sf)	1,000,000	370,000	500,000
Hotel Rooms	325	-	-
Total Commercial Area (sf)	2,500,000	1,000,000	3,500,000
Employment	5,600 *	2,300 *	4,035 **
Total Daily Trips	45,143	19,827	35,994
Estimated eBART Riders ***	2,060	620	1,124

1. * Estimated employment for the Proposed Plan and Alternative Plan was calculated using the following assumptions:
    - Retail employment is assumed to generate one job for every 500 square feet of gross floor area, based on total gross acres of land.
    - Office employment is assumed to generate one job for every 350 square feet of gross floor area, based on total gross acres of land.
    - Hotel employment is assumed to generate 0.8 job per hotel room.
2. ** Estimated employment for the No Project scenario was calculated using the following assumptions:
    - Retail employment in the TOD area is assumed to generate one job for every 500 square feet of gross floor area, based on total gross acres of land.
    - Business park employment is assumed to generate one job for every 1,000 square feet of gross floor area, based on total gross acres of land.
3. *** Estimated eBART ridership is based on the following assumptions:
    - 0.1 rider per job
    - 0.6 rider per housing unit

Source: Dyett and Bhatia, 2008.

ALTERNATIVE PLAN

The Alternative Plan is based on the BART Proposed Project, which includes one eBART station in the SR 4 median close to Hillcrest Avenue at the Median Station location. The assumed 2035 circulation network is the same as the proposed Plan, with two key exceptions. The Alternative Plan does not include the construction of a Phillips Lane interchange within the planning period; and does not include a potential second station in the eastern portion of the Planning Area.

Because the Phillips Lane interchange is not assumed to be built, the Phillips Lane extension would be constructed as a 2-lane collector rather than as a 4-lane arterial.

The Alternative Plan assumes a much lower intensity of development than the proposed Plan. The Phillips Lane Interchange is not assumed to be built, and there will be major traffic and circulation constraints. Lower intensity development is assumed in the eastern portion of the site that is further from freeway interchanges. Very little development is expected to occur in the southeast quadrant in the area where there are steep hills. The PG&E electrical transmission towers and lines that cross north-south in the eastern Planning Area would remain in their current location, rather than being relocated as in the proposed Plan.

The Alternative Plan features residential and office use near the station to support the transit investment. The eastern portion is designated as lower intensity uses such as business park and a mixed-use neighborhood focused on commercial and residential uses. The Alternative Plan supports 650 residential units with approximately 1,680 new residents. The designated land uses and transportation system would support approximately 1.0 million square feet of commercial uses, 630,000 square feet of office and 370,000 square feet of retail, with about 2,300 new jobs at buildout.

NO PROJECT – EXISTING ANTIOCH GENERAL PLAN

The no project scenario is based on the current General Plan, which was updated in 2003. The Zoning Ordinance was updated to implement the General Plan in 2005. Therefore, this scenario illustrates the expected development if the Planning Area's existing policies and land use regulations were to remain in place, and planned circulation improvements were to be constructed, including BART service. The major differences between the proposed Plan and the General Plan are listed in Table E-5.

Table E-5 General Plan and Proposed Plan Assumptions

Difference	*General Plan*	*Proposed Plan*
Planning Horizon	2030	2035
BART Station Location	Near railroad track and Viera Ave	In SR 4 Median near Hillcrest Avenue
Phillips Lane Interchange	Not included	Assumed to be built, but not part of Specific Plan
Viera Avenue	Not extended	Re-aligned and extended to Slatten Ranch Road with railroad grade separation
Willow Avenue	Improved with a railroad grade separation	Does not include a grade separation or specific improvements
Eastern set of PG&E Transmission Towers and Lines	Not relocated	Relocated along the SR 4/SR 160 right-of-way

The General Plan identifies the Planning Area as the SR 4 Industrial Frontage Focus Area. The designated land uses are mostly low-intensity uses such as business park. Transit-oriented development is designated near a BART station located in the Planning Area near the Union

Pacific railroad tracks. Based on the land use designations in the 2003 General Plan, and the detailed text and tables in the General Plan that explain allowed densities, this area would support approximately 1,200 housing units and 4,035 jobs.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Overall, the Alternative Plan would have the least environmental impact of the alternatives that were evaluated due to its lower development density and least amount of population and jobs. However, there would be significant environmental impacts related to circulation and noise and the Alternative Plan does not achieve the objectives for the Hillcrest Station Area as effectively as the proposed Plan.

The benefits of less intensive development are derived from exposing fewer people and less development to environmental hazards such as flooding, earthquakes, fires, etc. and potentially using fewer resources to construct and operate the development. Under the Alternative Plan, the hills in the southeastern quadrant of the Planning Area may not be developed during the planning horizon; however, development in this area is not precluded. Maintaining the hills and the unnamed creek tributary would decrease potential impacts of most of the environmental topics analyzed. Less intensive development would require fewer public services and less water, energy, and overall infrastructure.

On the other hand, the Alternative Plan does not achieve some of the primary objectives of the Hillcrest Station Area Specific Plan, such as creating an employment center; generating transit ridership; and minimizing impacts on regional highway facilities. The Alternative Plan would support 60 percent fewer jobs than the proposed Plan. Even though the jobs per housing unit ratio would be higher, the 2,300 jobs supported by the land uses in the Alternative Plan would account for less than 6 percent of the City's total employment. The General Plan land uses for the Planning Area would support more than 4,000 jobs, and the Specific Plan objective is to accommodate at least 5,000 jobs. Therefore, the Alternative Plan does not meet the City's goal of creating an employment center near transit and regional road network.

Another important goal of the Hillcrest Specific Plan is to serve as the Ridership Development Plan for the eBART project. The land uses are to generate ridership and support the large public investment. The Alternative Plan would only generate about 7 percent of the total eBART ridership projected for the Hillcrest Station, as compared to the proposed Plan, which will generate about 25 percent of the ridership. Therefore, the majority of the riders will be driving or taking the bus to the station, exacerbating traffic congestion and increasing parking demand.

Most critically, the Alternative Plan does not mitigate for the traffic impacts it would have on the local and regional roads. The land use and circulation plans are not as well integrated and traffic congestion is not as well mitigated as in the proposed Plan. The Alternative Plan creates 55 percent fewer daily automobile trips, but the resultant traffic congestion is projected to be much worse than under the proposed Plan. The operations of four intersections and freeway operations on SR 4 would fail under the Alternative Plan. The less intensive development also means that there is a lower internal trip capture rate, which results in a higher than average vehicle miles traveled VMT per resident and employee than the proposed Plan. Therefore, the reductions in traffic congestion, air pollution and greenhouse gas emissions, and noise are not proportionate with the reduction in population.

E.5 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

The proposed policies of the Hillcrest Station Area Specific Plan described in Chapter 3 in the EIR would avoid or eliminate most potentially significant impacts. However, two impacts classified as significant and unavoidable have been identified in the issue areas of circulation and noise.

CIRCULATION

Intersection Operations

Implementation of the proposed Hillcrest Station Area Specific Plan would result in two intersections operating at less than the adopted standard: Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue intersection and Hillcrest Avenue at SR 4 Eastbound Ramp intersection. The City has considered additional measures to comply with the LOS criteria at these two intersections. Measures considered include realigning Tregallas Drive and Larkspur Avenue to the south to improve vehicle storage between this intersection and the SR 4 eastbound off-ramp intersection. This change was determined to be infeasible during the planning horizon because it would require the acquiring and demolition of active and viable commercial properties, residential properties, and a church south of the Planning Area. Other measures considered, such as realigning the Hillcrest Avenue corridor and/or constructing new/modified ramps to/from SR 4 eastbound, would have similar right-of-way impacts.

Two other intersections have the potential to have significant and unavoidable impacts: the Hillcrest Avenue/East 18th Street intersection and the Neroly Road/Oakley Road intersection. Both of these intersections are outside the Planning Area and beyond the scope of the defined project. The proposed Specific Plan includes policies to support improving the operations of these intersections, but if improvements are not made than these two intersections would also operate at unacceptable LOS E or F conditions in 2035 with buildout of the Specific Plan.

Freeway Operations

There are also potential significant and unavoidable impacts to freeway operations due to the implementation of the eBART project, regional growth, and the Hillcrest Station Area Specific Plan. By 2035, due to the eBART project and regional growth, it is projected that freeway traffic will experience delay indexes of up to 3.3, traveling at 21 miles per hour average speed. The addition of development in the Hillcrest Station Area would exacerbate this congestion even further.

The construction of the SR 4/Phillips Lane Interchange has been identified by the City as the most feasible solution. If a new interchange is implemented, the delay index would remain the same or improve in the AM peak hours, and worsen only slightly in PM peak hours. This mitigation would allow the freeway to operate within the adopted standards.

The City has considered measures to address the severe traffic congestion at the Hillcrest Avenue Interchange beyond those identified in the SR 4 East Widening Project including additional ramp widening, alternative interchange configurations, and realigning local roads to improve interchange efficiency. These changes would all require the acquiring and demolition of active and viable commercial properties, residential properties, and a church south of the Planning Area. The alternatives were considered infeasible given the substantial impact to the right-of-way.

NOISE

The current City standards state that development near SR 4, the SR 4 Bypass, and the eBART project may not result in increases greater than five CNEL above existing noise levels. Four locations within the Planning Area exceed this standard. Each of these locations is adjacent to the Union Pacific Mococo railroad, and freight rail will be the primary noise source. If Union Pacific resumes freight rail service on the Mococo line, and if no grade separation is provided at Hillcrest Avenue, the noise impacts are significant. However this impact is due to the resumption of rail service, and is not an impact of the Specific Plan.

There are mitigation actions that could reduce the noise levels to a less than significant level. The grade separation at Hillcrest Avenue and the Union Pacific rail line, and a grade separation lowering the elevation of the rail line itself into a below-grade channel, would mitigate the noise impact. However since those projects are not within City control, and there is no identified funding source, these cannot be assumed as mitigations. Therefore the impacts of the railroad line noise on the proposed development under the Specific Plan are significant and unavoidable.

The policies of the Specific Plan ensure that noise impacts are mitigated to the maximum extent feasible, and that in areas where exterior noise levels cannot be met, interior noise levels are reduced below the minimum standard in order to compensate for the noise in exterior spaces.

E.6 SUMMARY OF IMPACTS

Table E-6 presents the potential environmental impacts that would result from the implementation of the Hillcrest Station Area Specific Plan, along with the proposed policies that reduce each impact and the ultimate finding of significance. Detailed discussions of the impacts and policies are in Chapter 3. Cumulative impacts are generally addressed in Chapter 5. The detailed discussions of the cumulative impact analysis for the following sections are in Chapter 3: Circulation and Traffic, Air Quality, Climate Change and Energy, Noise, Biological Resources and Hydrology and Water Quality.

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
3.1 Aesthetics and Visual Resources			
3.1-1	Construction of new development under the proposed Plan could adversely affect visual resources in the short-term during period of construction by blocking or disrupting views.	UD-17 Reduce the visibility of construction yards and staging areas to the maximum extent possible. • Construction yards and staging areas shall be located as close to construction areas to the extent practicable away from residential and commercial areas, community traffic, pedestrian use, and local views. • Low contrast fencing and screening shall be used to minimize contrast with surrounding environment.	Less than Significant
3.1-2	New development under the proposed Plan could adversely affect scenic views, scenic resources, or the existing visual character of the Planning Area.	UD-12 Site or design projects to consider their intrusion into important view-sheds towards Mount Diablo and the San Joaquin River. UD-13 Incorporate view opportunities towards Mount Diablo into site plans, such that views of Mount Diablo are available from both public streets and public open spaces at specified locations. UD-14 Design buildings to take advantage of views to Mount Diablo, and views of the San Joaquin River from taller buildings. UD-18 The hillside areas of the site adjacent to SR 4 may be graded to accommodate development. Low-lying areas may be filled to create level development sites. • All grading and cut and fill activities must be consistent with the environmental protection and hazard policies in Chapter 5. • Graded slopes and exposed earth surfaces shall be re-vegetated at the earliest opportunity. UD-19 Design projects to minimize abrupt changes in scale and massing between the project and surrounding natural or man-made forms, such as hillsides, adjacent freeways, and low-lying wetlands. Where appropriate, step buildings up or down to be compatible with the scale of natural features. UD-26 Locate streets adjacent to parks, pedestrian trails, and detention basins, in order to allow public access to and public views of these recreation and water areas. Avoid locating private rear yards along these public recreation and water areas; this precludes public access and views and can also pose security problems. UD-5 Design the Freeway Area such that businesses can take advantage of the freeway visibility and access, and SR 4 becomes a visually attractive freeway corridor. • Provide landscape buffers adjacent to the rail line and the highway per the policies regarding landscape buffers. • Commercial facades facing the freeway and Slatten Ranch Road should both be designed with high-quality materials due to their visibility. Design the freeway-facing building facades with windows, equivalent in design quality to a front façade, in order to present an attractive appearance from the freeway. • Limit the number of freeway-oriented signs allowed	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		within the Hillcrest Station Area. Work with businesses and property owners to create high-quality, consistent freeway signage for the Hillcrest Station Area. Design any freeway-oriented signs such that SR 4 remains a corridor that is eligible for Scenic Highway designation. UD-15 Design project site plans and buildings to preserve the potential for Scenic Highway designation for SR 4 and SR 160 adjacent to the Hillcrest Station Area. UD-16 Work with Contra Costa County and Caltrans to consider the "complete" highway system and minimize impacts on the quality of the views or visual experience, particularly for projects greater than 40 acres in scope.	
3.1-3	New development under the proposed Plan could result in increased light and glare.		Less than Significant
3.2 Air Quality			
3.2-1	New development under the proposed Specific Plan could be inconsistent with the assumptions in the Bay Area 2005 Ozone Strategy.	C-1 Create a connected street network of arterials and collectors that connects with existing local and regional roadways, and provides circulation throughout the Station Area. C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish: • Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and, • Maximum block lengths of approximately 450 feet, or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block). C-6 Minimize cul-de-sacs to the maximum extent possible. Where cul-de-sacs are necessary due to barriers such as freeways and detention basins: • Provide at least one pedestrian and bicycle path at the circular end in order to connect to other streets and trails, to allow emergency vehicle access when warranted and to minimize response times for emergency access; and, • Consider designing cul-de-sacs with a planted cul-de-sac island to limit the amount of pavement and increase stormwater management opportunities. C-8 All applications for master plans, subdivisions, and development projects shall indicate how streets are connected to existing local and regional roadways, and how a connected network of streets is created throughout the Hillcrest Station Area. LU-3 Create a Transit Village in the western portion of the Hillcrest Station Area north of the Union Pacific Railroad right-of-way, with direct pedestrian, bicycle, bus transit, and automobile connections to the eBART station in the median of SR 4. LU-8 Develop a Town Center in the eastern portion of	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		the Hillcrest Station Area that incorporates retail, entertainment, hospitality, and residential uses in a "lifestyle center" or other pedestrian-oriented format. LU-14 Allow compatible retail, restaurant, personal service, and other commercial uses within the Office TOD district. These uses must be on the ground floor and publicly accessible. LU-16 Up to 100 square feet of compatible retail, restaurant, personal service, office, and other commercial uses per residential unit is allowed within the Residential TOD district. These uses must be on the ground floor or second floor, and must be publicly accessible. LU-4 Locate high-density residential development within a half-mile walk from the eBART station. • A range of housing types may be included in a development project, some of which may be as low as 10 units per acre provided the total project meets the minimum density standard. • Residential units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts. LU-24 Locate eBART parking so that it is accessible to passengers arriving by car, bus, bicycle, or on foot. LU-27 Provide public bus facilities near each eBART station. C-3 Design streets so that they incorporate medians, landscaping, sidewalks, street trees, travel lanes, bike lanes, and on-street parking, such that they: • Are consistent with the desired pedestrian-oriented character and safety; and, • Meet the needs of all users including drivers, pedestrians, persons with disabilities, bicyclists, and transit users. C-36 Develop a multi-modal transit center at the median eBART station that provides access to eBART, buses, taxies, and shuttles. Design the transit facilities to include: • Bus transit center and approximately 8-12 bus bays (moved from the Hillcrest Park-and-Ride lot to the eBART Station parking area); • Kiss-and-ride limited term parking area; • Disabled parking; • Shuttle pick up and drop off area; and, • Safe and attractive pedestrian and bike crossings to the station. C-38 Design arterials and arterial intersections, particularly near pedestrian-oriented streets, to accommodate transit services, including bus stops, pull-outs, and shelters. C-39 Prioritize pedestrian and bicyclist safety at intersections and street crossings with measures such as: • Contrasting and/or textured paving crosswalks;	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		• In-ground, blinking crosswalk lights; and, • Pedestrian refuges and bulb-outs. C-41 Require development projects to provide walking and biking routes directly to major destinations such as parks, pedestrian centers, and eBART stations. C-42 Adopt minimum bicycle parking requirements for residential and commercial projects. Bicycle parking should be designed with the following criteria: • Short-term parking should be visible from the main entrance of buildings. • Long-term parking should be provided in secure, well-lighted areas. C-46 Sidewalks should have at least a five-foot wide clear path of travel. C-47 Provide bike routes throughout the Station Area, as illustrated in Figure 3-5. • Class 1: Continuous multi-purpose trail along East Antioch Creek and the detention basins • Class 2: Slatten Ranch Road, Phillips Lane, and Viera Avenue C-48 Allow bicycle circulation on all local streets, to the extent feasible. C-49 Design and implement a multi-use trail loop around the wetlands and East Antioch Creek. This loop should include at least two pedestrian crossings across the creek. C-50 Provide multi-use trails that connect from East Antioch Creek to existing neighborhood parks north of the Station Area. C-22 Apply a Transportation Demand Management (TDM) program that reduces single-occupant vehicle trips to development exceeding 25,000 square feet of non-residential space. Components of TDM programs could include: • Contributions to urban design projects, such as: - Bicycle parking, both short- and long-term, located in appropriate places; and, - Direct routes to transit (station, shuttle, or bus) and other key destinations that are well-lit and designed for pedestrian comfort. • Employer-based programs, such as: - Carpool and vanpool ride-matching services; - Designated employer TDM contact; - Guaranteed ride home for transit users and car/vanpoolers; - Transit subsidies for employees; - Flexible work schedules, shortened work weeks, or options to telecommute; - Information campaigns using brochures, boards/kiosks, or other communication outlets; and, - Employer provided showers and lockers. • Meeting or exceeding project design standards,	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		such as: - Free and preferential parking for carpools, vanpools, low-emission vehicles, and car-share vehicles; - Passenger loading zones; and, - Bicycle- and pedestrian- friendly site planning and building design.	
3.2-2	Implementation of the proposed Specific Plan would expose residents and employees to toxic air contaminants and odors.	EH-1 Require air quality analysis based on project-specific development when permit applications are submitted for sensitive receptor uses (such as hospitals, schools, residential uses, and nursing homes) within 300 feet of SR 4, SR 160, the Union Pacific Railroad tracks, or stationary toxic air contaminant sources. If the results show that the carcinogenic human health risk exceeds the BAAQMD standards for toxic air contaminants, the City shall require upgraded ventilation systems with high efficiency filters or equivalent mechanisms to minimize health risks for future residents. EH-2 Require project sponsors to inform future and/or existing sensitive receptors of any potential health impacts resulting from nearby sources of dust, odors, or toxic air contaminants, and where mitigation cannot reduce these impacts. LU-23 Locate residential units away from railroads and freeways, to minimize impacts from noise and air emissions. Units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts. UD-20 Provide a continuous landscape buffer along both sides of the rail line corridor, outside of the Union Pacific and Chevron easements. The minimum width of the landscaped buffer shall be 25 feet if adjacent to a building; and 15 feet if adjacent to a street. • Include landscaping, berming (typically 4 to 5 feet high), and at least one continuous row of trees throughout the area. • This landscape buffer may be located within the Chevron easement if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project. UD-21 Provide a continuous landscape buffer, with a minimum width of approximately 25 feet, immediately adjacent to both SR 4 and SR 160. • Design landscaping along highway corridors to add significant natural elements and visual interest to soften the hard edged, linear travel experience that would otherwise occur. • Include landscaping and a double row of trees. • This landscape buffer may be located within the Caltrans right-of-way if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project. UD-22 Provide a continuous landscape buffer, with a minimum width of approximately 25 feet, around the	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		southern and eastern edges of the Hillcrest PG&E Substation. • Include landscaping and a continuous double row of trees to screen the facility from new development, SR 4, and the eBART station. • Work with PG&E when the company decides to expand substation operations within their site, to ensure an adequate separation is retained between the substation and development. EH-39 As part of the project entitlement process, appropriate studies shall be conducted for each site with an open remediation case based on proposed land uses by a qualified environmental professional. The studies shall compare maximum soil, soil gas, and groundwater concentrations to relevant environmental screening levels (ESLs) and evaluate all potential exposure pathways from contaminated groundwater and soil. As required by the appropriate responsible agency, studies shall be prepared for the: • Former Hickson-Kerley (FKP) Property (APN: 052-051-034); • Chevron Old Valley Pipeline; • TAOC New Love Pump Station Site (APN: 052-051-034); and, • PG&E Oakley Metering Station (APN: 052-051-035)	
3.2-3	Construction and demolition activities under the proposed Specific Plan could generate fugitive dust and other criteria pollutant emissions which could result health and nuisance impacts in the immediate vicinity of construction sites.	EH-40 At sites with known contamination issues, a Construction Risk Management Plan (RMP) shall be prepared and approved prior to commencement of construction, to protect the health and safety of construction workers and site users adjacent to construction activities. EH-44 On parcels with existing structures, project sponsors shall submit to the City a project Demolition Plan that addresses onsite and offsite chemical and physical hazards. The Demolition Plan shall contain: • Information for any existing structures or buildings, regarding the presence of hazardous building materials such as asbestos-containing building materials, PCBs, and lead-based paint in existing buildings proposed for demolition, additions, or alterations; • Protocols for ensuring the safety of workers and the public during demolition or construction activities, as approved by the City. These protocols will include, but are not limited to: - Prior to demolition, hazardous building materials shall be removed and appropriately disposed of in accordance with all applicable guidelines, laws, and ordinances. - The demolition of buildings containing asbestos requires that licensed asbestos abatement contractors are retained and the Bay Area Air Quality Management District (BAAQMD) is notified ten days prior to initiating construction and demolition activities.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		- The Cal-OSHA-specified method of compliance for demolition activities involving lead-based paint including required respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, and training shall be required. - Any electrical transformers and fluorescent light ballasts that do not have labels stating that they do not contain PCBs, shall be treated as hazardous waste and are subject to all hazardous waste regulations.	
3.3 Biological Resources			
3.3-1	Construction and development activities under the proposed Specific Plan could impact non-listed nesting bird species protected under the federal Migratory Bird Treaty Act.	EH-3 Prior to approval of any subdivisions or development projects, project sponsors shall comply with mitigation measures to avoid impacts to nesting bird species protected under the federal Migratory Bird Treaty Act, as follows: • Project sponsors will avoid disturbing nesting raptors and other special-status birds by performing construction activities (i.e., ground clearing and grading, including removal of trees or shrubs) outside of the breeding season (February 1 through August 31), to the extent possible. • If construction activities are scheduled to occur during the breeding season (February 1 through August 31), the project sponsor will implement the following measures to avoid potential adverse effects on nesting raptors and other special-status birds: - The project sponsor will retain a qualified wildlife biologist to conduct preconstruction surveys of all potential nesting habitat within 500 feet of construction activities, where access is available. Surveys shall be conducted no more than 14 days prior to the first day of construction activities. - If active nests are found during preconstruction surveys, the project sponsor will create a no-disturbance buffer (size to be determined in consultation with CDFG) around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that all young have fledged. The size of these buffer zones and types of construction activities restricted in these areas will be based in part on existing noise and human disturbance levels in the project site. Nests initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the “take” (harm) of any individuals will be prohibited. - If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs within the construction footprint that are determined to be unoccupied by special-status birds or that are located outside the no-disturbance buffer for active nests, may be removed.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
3.3-2	Construction and development activities under the proposed Specific Plan could impact the Swainson's hawk and supporting habitat.	EH-4 Surveys for nesting Swainson's hawks shall be conducted semi-annually by a qualified biologist during the nesting season (March 1-September 15), beginning in the spring of 2009 and continuing until Planning Area development begins. • Surveys shall be conducted at the beginning of the breeding season (March/April) and towards the end of the season (August/September) to determine the extent of nesting activity. • Surveys shall be conducted within the Planning Area and extending out 0.25 miles from the Planning Area where possible. • If potentially occupied nests are within 0.25 miles of the Planning Area and public access is not possible, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the Planning Area. • Documentation of Swainson's hawk presence shall be submitted to the CDFG California Natural Diversity Database, and annual reports summarizing the results of the surveys shall be submitted to the City. • Project sponsor(s) shall provide funding to the City of Antioch to contract for the biologist's services. EH-5 Prior to the approval of a development permit in the Planning Area, the City shall determine whether Swainson's hawks are present in or within 0.25 miles of the Planning Area. Using the semi-annual survey results required in Policy EH-4 and the most recent CEQA environmental review documents for the Planning Area, it will be determined: • Whether nesting sites are active or have been vacant for the five consecutive years (and therefore "inactive") preceding the application date; and • If active, the total acreage of Swainson's hawk habitat, both nesting and foraging, that may be disturbed. EH-6 If active Swainson's hawk nests are identified, a permanent 100-foot buffer shall be created around the dripline of the nest trees. • No development shall occur within this buffer. • The buffer shall be fenced to prevent the nests from being disturbed. EH-7 If it is determined through Policy EH-5 that the Swainson Hawk nest is "active", then the project sponsor shall mitigate for lost Swainson's hawk nesting and foraging habitat using mitigation ratios prepared in consultation with CDFG, through mitigation credits or conservation easements. • As of 2008 the CDFG recommended the following mitigation ratios, which are subject to change: - 1:1 for foraging habitat within one mile of an active nest; - 0.75:1 for foraging habitat within one to five miles of an active nest; and	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		- 0.5:1 for foraging habitat within five to ten miles of an active nest. • Mitigated land should be as close as possible to the Planning Area. EH-8 During the nesting season (March 1–September 15), a qualified biologist shall conduct a preconstruction survey no more than 14 days prior to ground disturbance, to establish whether Swainson's hawk nests within 0.25 mile of the project site are occupied (unless this was already accomplished through Policy EH-4). • If potentially occupied nests exist within 0.25 mile of the Planning Area, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the Planning Area. • If active Swainson's hawk nests are identified during these pre-construction surveys, no construction activities shall occur during the nesting season within 0.25 mile of occupied nests or nests under construction, unless CDFG/USFWS agrees to a smaller buffer based on environmental conditions such as steep topography or dense vegetation. If young fledge prior to September 15, construction activities can proceed normally.	
3.3-3	Construction and development under the proposed Specific Plan could impact the western burrowing owl and its habitat.	EH-9 No more than 14 days before construction, a survey for burrowing owls and their burrows shall be conducted by a qualified biologist within 500 feet of the project (access permitting). The survey will conform to the protocol described by the California Burrowing Owl Consortium (1995), which includes up to four surveys on different dates if there are suitable burrows present. EH-10 If occupied owl burrows are found within the survey area, a determination will be made by a qualified biologist, in consultation with the CDFG, as to whether or not work will affect the occupied burrows or disrupt reproductive behavior. • If it is determined that construction will not affect occupied burrows or disrupt breeding behavior, construction will proceed without any restriction or mitigation measures. • If it is determined that construction will affect occupied burrows during the non-breeding season (August through February), the subject owls shall be passively relocated from the occupied burrow(s) according to a plan approved by the CDFG. The plan will include installation of one-way doors in occupied burrows at least 48 hours before the burrows are excavated, and will provide for the owl's relocation to nearby lands that possess available nesting habitat. • If it is determined that construction will physically affect occupied burrows or disrupt reproductive behavior during the nesting season (March through July), then avoidance is the only mitigation available. Construction will be delayed within 300 feet of occupied burrows until it is determined that the subject owls are not nesting or until a qualified biologist determines that juvenile owls are self-sufficient or are no longer using the natal burrow as their	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		primary source of shelter. EH-11 If the project requires the mitigation of Swainson's hawk foraging habitat, lost burrowing owl nesting and foraging habitat will be considered effectively mitigated with the acquisition of habitat or habitat credits, which replaces Swainson's hawk foraging habitat (see Plan Policy EH-7). EH-12 If the project does not require the mitigation of Swainson's hawk foraging habitat, lost burrowing owl habitat shall be compensated by the acquisition or conservation of 6.5 acres per breeding pair using the site, at the time of disturbance.	
3.3-4	Construction and development activities under the proposed Specific Plan could result in disturbance to special-status bat species.	EH-13 The project sponsor will avoid disturbance of hibernating or maternity bat roosts, by performing preconstruction surveys and creating no-disturbance buffers. EH-14 Prior to construction activities (i.e., ground clearing and grading, including removal of trees or shrubs) within 200 feet of trees and buildings that potentially support special-status bats, the project proponent will retain a qualified bat biologist to survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, strong odors) is present, no further mitigation is required. EH-15 If evidence of bats is observed, the project sponsor will carry out the following measures to avoid potential adverse effects to bats: • A no-disturbance buffer (acceptable in size to the CDFG) will be created around active roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the take of individuals will be prohibited. • Removal of trees/buildings showing evidence of bat activity will occur during the period least likely to affect bats, as determined by a qualified bat biologist (generally between February 15 and October 15 for winter hibernacula, and between August 15 and April 15 for maternity roosts). If exclusion is necessary to prevent indirect impacts to bats due to construction noise and human activity adjacent to trees showing evidence of bat activity, these activities will also be conducted during these periods.	Less than Significant
3.3-5	New development under the proposed Specific Plan could result in disturbance to the valley elderberry longhorn beetle.	EH-16 The project sponsor shall avoid Valley Elderberry Longhorn Beetle (VELB) habitat or prepare a VELB Mitigation Plan: • Regardless of whether or not VELB exit holes are present, all elderberry shrubs with stems at least one inch in diameter shall be avoided, and a 100-foot buffer shall be established around the dripline of the shrubs. The 100-foot buffer may be adjusted in consultation with the USFWS. If avoidance is achieved, a letter report confirming avoidance shall be sent to the USFWS and no further mitigation would be required. • If disturbance within 100 feet of the dripline of the elderberry shrubs with stems greater than or equal to one inch in diameter is unavoidable, then the project sponsor will: (1) conduct surveys for the VELB in accordance with the	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS, 1999); and (2) mitigate for impacts in accordance with these guidelines (USFWS, 1999).	
3.3-6	New development under the proposed Specific Plan could degrade streams, wetlands, and riparian habitats potentially subject to state and federal protection.	EH-17 The project sponsor will avoid or minimize effects on streams, ponds, wetlands, and riparian habitat when possible. If underground utility crossings are required underneath East Antioch Creek, contractors shall employ jack-and-bore construction techniques for these crossings. EH-18 For impacted wetlands, the project sponsor shall restore/create wetlands on or off site at a 2:1 ratio. A wetland mitigation and monitoring plan (referred to in General Plan Policies 10.3.2(e) and 10.4.2(d) as a Resource Management Plan) shall be developed and submitted to the Corps and any other applicable agencies, that includes the following: • description of wetland types; • performance standards and monitoring protocol to ensure the success of the mitigation wetlands over a period of five to ten years; • engineering plans showing the location, size, and configuration of wetlands to be created or restored, as applicable; • an implementation schedule showing when construction of mitigation areas shall occur, as applicable; and • a description of legal protection measures for preserved wetlands, as applicable (i.e., dedication of fee title, conservation easement, and/or an endowment held by an approved conservation organization, government agency, or mitigation bank). EH-19 As part of the development review process for projects adjacent to or including East Antioch Creek, the project sponsor shall create a Resource Management Plan for the creek corridor, as required by the General Plan Policy 10.4.2(d), in order to retain native vegetation in and along East Antioch Creek and prevent its degradation. Components of this Plan shall include but are not limited to: a vegetation palette consisting of native species for any landscaping that the project sponsor would like to do within the corridor, and methods for plant installation; vegetation monitoring; herbivore and weed control; irrigation; and site protection. EH-20 The project sponsor shall establish a minimum 50-foot buffer from the delineated edge of the wetlands and the freshwater marsh vegetation. No development shall occur within this buffer. • In an effort to avoid impacts to wildlife, including nesting birds and sensitive habitats, a fence shall be erected between the outer edge of the buffer area and the development, to keep pets out. The fence shall be at least four feet in height. • A 25-foot additional buffer containing a recreation trail composed of permeable or semi-permeable surface may be located outside of the 50-foot buffer.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		EH-21 Pedestrian and vehicle bridges proposed to cross over East Antioch Creek shall be designed to span the bed and bank of streams and avoid or minimize bridge piers or footings within the stream, within bridge safety limits. • If possible, the span of bridges that cross streams should also include some upland habitat beneath their spans to provide dry areas for wildlife species that do not use creeks or for use during storms. • Native plantings, natural debris, or rocks should be installed under bridges to provide wildlife cover and encourage the use of crossings.	
3.3-7	New development under the proposed Specific Plan could interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	EH-22 Provisions shall be made for wildlife under-crossings for new roads near East Antioch Creek. Tunnels or culverts must be the minimum length, height, and width necessary to provide safe passage under the road. Culvert designs will be based on the best available data at the time of the development application.	Less than Significant
3.3-8	The proposed Specific Plan could conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	EH-23 All "established" trees that will be retained shall be adequately protected during grading and construction. • Trees to be preserved immediately adjacent to the construction area should be protected with a minimum four-foot construction fence placed at least three feet outside the tree's dripline. • Care should be taken not to change the grade of the protected trees either by fill or grading. Any proposed grading within the dripline of protected trees will require further site investigation and recommendations by a certified arborist. EH-24 Trees to be retained at the edge of the construction area should be pruned prior to the start of construction to remove dead wood that might present a safety hazard. Trees to be retained in landscape buffers and open space areas should be pruned of dead wood to minimize human hazards. EH-25 The project sponsor will guarantee the health of all trees to be preserved within and adjacent to the proposed project site for three years. The project sponsor will replace any tree that is to be retained but that dies as a result of project construction activities during the guarantee period, with two 24-inch box, native trees, and the City of Antioch may require the posting of a bond pursuant to the Municipal Code. EH-26 A plan for control of the Tree of Heaven species should be prepared and implemented in order to prevent root and sprout damage to concrete and asphalt pavement and building foundations.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
3.4 Circulation and Traffic			
3.4-1	Increased motor vehicle traffic would result in unacceptable level of service (LOS) at study intersections.	C-1 Create a connected street network of arterials and collectors that connects with existing local and regional roadways, and provides circulation throughout the Station Area. C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish: • Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and, • Maximum block lengths of approximately 450 feet, or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block). C-4 Require land dedication and street improvements to be built consistent with street designs described in Chapter 4, Urban Design, for all arterials, collectors, and local streets in the Hillcrest Station Area. C-5 Limit potential traffic and parking impacts from new development on existing neighborhoods by: • Re-routing existing collector alignments outside existing neighborhoods, where feasible; • Providing direct access to the arterial and regional road network from any new streets; and, • Installing traffic calming measures where necessary. C-6 Minimize cul-de-sacs to the maximum extent possible. Where cul-de-sacs are necessary due to barriers such as freeways and detention basins: • Provide at least one pedestrian and bicycle path at the circular end in order to connect to other streets and trails, to allow emergency vehicle access when warranted and to minimize response times for emergency access; and, • Consider designing cul-de-sacs with a planted cul-de-sac island to limit the amount of pavement and increase stormwater management opportunities. C-8 All applications for master plans, subdivisions, and development projects shall indicate how streets are connected to existing local and regional roadways, and how a connected network of streets is created throughout the Hillcrest Station Area. C-9 Arterials and collectors should be located as shown in Figure 3-4 Circulation Plan; however, locations may be modified based on additional engineering or environmental analysis, or a completed master plan that shows how all parcels will be adequately served. Streets shall be located consistent with the following criteria: • Arterials are to be generally located along property lines. • Collector alignments may vary to accommodate site conditions and development proposals, provided that the streets align and join directly with existing and/or future	Significant and Unavoidable

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		collector streets on adjoining properties. C-10 Construct a four-lane east-west road, Slatten Ranch Road, south of the Union Pacific Railroad from Hillcrest Avenue to SR 160 to serve the eBART Station and development between SR 4 and the Union Pacific right-of-way. Design this road consistent with the following criteria: • Connect Sunset Drive west of Hillcrest Avenue with the Station Area; • Accommodate easy and direct access for buses in and out of the eBART station; and • Ensure that BART service can be extended to the east in or adjacent to the Union Pacific railroad right-of-way. Design of this corridor will need to be coordinated with Caltrans, Union Pacific Railroad, and BART. C-11 The City shall address traffic congestion at the Hillcrest Avenue and East 18th Street intersection. Starting in 2015, the City shall monitor the turning movements at this intersection with annual traffic counts. • When the average delay per vehicle is exceeds 45 seconds (or the current CCTA level of service standard), the City engineer shall initiate a comprehensive engineering study to define feasible mitigations and the project's fair share of the cost of improvements. • When the average delay per vehicle is 55 seconds (or the Level of Service reaches E), proceed with design and construction of the improvements defined in the engineering study. C-12 Extend and re-align Viera Avenue between East 18th Street and Slatten Ranch Road. Design this road consistent with the following criteria: • Realign Viera Avenue so that Station Area traffic does not impact existing neighborhoods, as generally shown in Figure 3-4. • Add a left turn lane from northbound Viera Avenue to westbound East 18th Street. • Work with PG&E to design the alignment so that Viera Avenue minimizes impacts to the PG&E electrical transmission and natural gas rights-of-way. • Construct an overcrossing at East Antioch Creek that minimizes impacts to the creek, detention basins, and recreational areas. • Construct an overcrossing or undercrossing at the railroad tracks that serves vehicles, pedestrians, and bicycles. Design the crossing to maximize developable land. The design of this crossing should also be coordinated with the design of the railroad grade separation at Hillcrest Avenue. C-13 Extend and improve Oakley Road to serve the Hillcrest Station Area. Design this road consistent with the following criteria: • Minimize impacts to the Oakley Detention Basin; • Limit traffic and parking from the Station Area within existing neighborhoods;	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		• Support and encourage pedestrian-oriented land uses between the Oakley Detention Basin and the PG&E substation; and, • Do not preclude a future connection with Hillcrest Avenue featuring a right-in, right-out intersection, if warranted. C-15 Extend and improve Phillips Lane south of East 18th Street to Slatten Ranch Road. Design this road consistent with the following criteria: • Serve the development within the Town Center; • Minimize impacts to East Antioch Creek and recreational uses; • Cross over the railroad; • Intersect with Slatten Ranch Road; and • Provide access to the Phillips Lane Interchange. City and Regional Transportation Improvements C-16 Work with CCTA and Caltrans to implement Hillcrest Avenue Interchange improvements. The final design of the improvements should consider the potential railroad grade separation at Hillcrest Avenue. C-17 Work with Union Pacific Railroad to provide a grade separation at the intersection of the Mococo Railway right-of-way and Hillcrest Avenue, if it is determined that the rail operator will resume active rail service. Explore all feasible design solutions with the goal to minimize the impacts on existing development and new development in the Hillcrest Station Area. C-18 Work with Caltrans to approve, design, and construct a full SR 4 interchange at Phillips Lane. Work with federal, state, and local agencies such as the Fee and Finance Authority to secure funding for the Phillips Interchange. C-19 The City and project sponsors shall work with neighboring cities and regional agencies to construct Slatten Ranch Road from west of SR 160 to Laurel Avenue. C-20 The City shall ensure that Wild Horse Road is extended and connected to the SR 4 Bypass Frontage Road, “Slatten Ranch Road,” to improve local access to parks, schools, and fire stations. C-21 Work with the City of Oakley to monitor traffic levels and level of service at the Neroly Road and Oakley Road intersection, and support efforts to design and construct needed improvements. C-22 Apply a Transportation Demand Management (TDM) program that reduces single-occupant vehicle trips to development exceeding 25,000 square feet of non-residential space. Components of TDM programs could include: • Contributions to urban design projects, such as: - Bicycle parking, both short- and long-term, located in appropriate places; and, - Direct routes to transit (station, shuttle, or bus) and other key destinations that are well-lit and designed for	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		pedestrian comfort. • Employer-based programs, such as: - Carpool and vanpool ride-matching services; - Designated employer TDM contact; - Guaranteed ride home for transit users and car/vanpoolers; - Transit subsidies for employees; - Flexible work schedules, shortened work weeks, or options to telecommute; - Information campaigns using brochures, boards/kiosks, or other communication outlets; and, - Employer provided showers and lockers. • Meeting or exceeding project design standards, such as: - Free and preferential parking for carpools, vanpools, low-emission vehicles, and car-share vehicles; - Passenger loading zones; and, - Bicycle- and pedestrian- friendly site planning and building design. I-5 Construct the following circulation improvements in conjunction with development of the Freeway Area: • Slatten Ranch Road from Hillcrest to SR 160 • At least one emergency access route connecting Slatten Ranch Road to Oakley Road I-7 Construct the following circulation improvements in conjunction with development of the Transit Village Area: • Viera Avenue (New) from East 18th Street to Oakley Road • Viera Avenue Connection from Oakley Road to Slatten Ranch Road, with an Overcrossing or Undercrossing of the Railroad Line • Pedestrian/Bicycle Bridge over the Railroad Line to the eBART Station Entrance (required only if the Median Station is selected instead of East Median) • Oakley Road from Viera Avenue (New) to Willow Ave. I-9 Development within the Town Center Area shall not occur until the Phillips Lane Interchange is officially approved by Caltrans and funding sources are identified, or other regional transportation improvements that resolve the projected congestion at the SR 4/Hillcrest Interchange are identified, included in the Contra Costa County Regional Transportation Plan, and funding sources are identified. I-11 Construct the following circulation improvements in conjunction with development of the Town Center Area north of East Antioch Creek. • Widen Oakley Road from SR 160 to Willow Avenue • Redesign the Willow Avenue/Oakley Road Connection • Phillips Lane from East 18th Street to Oakley Road I-12 Construct the following circulation improvements in	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		conjunction with development of the Town Center Area south of East Antioch Creek. • Phillips Lane Connection to Slatten Ranch Road: Overcrossing • Phillips Lane and SR 4 Interchange • Phillips Lane from Slatten Ranch Road to SR 4 and Interchange	
3.4-2	Increased motor vehicle traffic would result in increased Delay Indices at study freeway segments.	The proposed policies listed under Impact 3.4-1 would also help to reduce the impact on freeway operations.	Significant and Unavoidable
3.4-3	Implementation of the proposed Specific Plan would generate additional Vehicle Miles Traveled.	LU-3 Create a Transit Village in the western portion of the Hillcrest Station Area north of the Union Pacific Railroad right-of-way, with direct pedestrian, bicycle, bus transit, and automobile connections to the eBART station in the median of SR 4. LU-24 Locate eBART parking so that it is accessible to passengers arriving by car, bus, bicycle, or on foot. LU-25 Work with BART to ensure that at least 1,000 parking spaces are provided in close proximity to the eBART Station by 2015, and that 2,600 spaces are provided by 2035. LU-27 Provide public bus facilities near each eBART station. C-10 Construct a four-lane east-west road, Slatten Ranch Road, south of the Union Pacific Railroad from Hillcrest Avenue to SR 160 to serve the eBART Station and development between SR 4 and the Union Pacific right-of-way. Design this road consistent with the following criteria: • Connect Sunset Drive west of Hillcrest Avenue with the Station Area; • Accommodate easy and direct access for buses in and out of the eBART station; and • Ensure that BART service can be extended to the east in or adjacent to the Union Pacific railroad right-of-way. Design of this corridor will need to be coordinated with Caltrans, Union Pacific Railroad, and BART. C-35 The City shall continue working with BART, CCTA, Caltrans, and property owners to study design, funding, and construction options for the Hillcrest eBART station, including but not limited to the East Median Station, which is the City's preferred station location. The design and location of the station should be modified from the current Median Station plan to achieve the following goals: • Provide a more direct pedestrian and bicycle route from the Transit Village pedestrian center to the eBART station, with a distance of no more than one-quarter mile, and the minimum number of grade changes; • Provide shorter, more direct vehicular access between the Transit Village Area to the eBART station; • Maximize developable land, especially properties with freeway visibility, and properties in the Transit Village	For Informational Purposes Only

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		Area; and • Provide an attractive view from the eBART station, that includes a direct line of sight to the Transit Village, and screens the view of the PG&E station; and • Maximize opportunities for shared parking between BART patrons and other land uses. C-36 Develop a multi-modal transit center at the median eBART station that provides access to eBART, buses, taxies, and shuttles. Design the transit facilities to include: • Bus transit center and approximately 8-12 bus bays (moved from the Hillcrest Park-and-Ride lot to the eBART Station parking area); • Kiss-and-ride limited term parking area; • Disabled parking; • Shuttle pick up and drop off area; and, • Safe and attractive pedestrian and bike crossings to the station. C-37 Work with Tri-Delta Transit to minimize impacts to existing service while serving the Station Area. C-38 Design arterials and arterial intersections, particularly near pedestrian-oriented streets, to accommodate transit services, including bus stops, pull-outs, and shelters.	
3.4-4	Implementation of the proposed Specific Plan could increase transit demand.	LU-3 Create a Transit Village in the western portion of the Hillcrest Station Area north of the Union Pacific Railroad right-of-way, with direct pedestrian, bicycle, bus transit, and automobile connections to the eBART station in the median of SR 4. LU-24 Locate eBART parking so that it is accessible to passengers arriving by car, bus, bicycle, or on foot. LU-25 Work with BART to ensure that at least 1,000 parking spaces are provided in close proximity to the eBART Station by 2015, and that 2,600 spaces are provided by 2035. LU-27 Provide public bus facilities near each eBART station. C-10 Construct a four-lane east-west road, Slatten Ranch Road, south of the Union Pacific Railroad from Hillcrest Avenue to SR 160 to serve the eBART Station and development between SR 4 and the Union Pacific right-of-way. Design this road consistent with the following criteria: • Connect Sunset Drive west of Hillcrest Avenue with the Station Area; • Accommodate easy and direct access for buses in and out of the eBART station; and • Ensure that BART service can be extended to the east in or adjacent to the Union Pacific railroad right-of-way. Design of this corridor will need to be coordinated with Caltrans, Union Pacific Railroad, and BART. C-35 The City shall continue working with BART, CCTA, Caltrans, and property owners to study design, funding, and construction options for the Hillcrest eBART station,	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		including but not limited to the East Median Station, which is the City's preferred station location. The design and location of the station should be modified from the current Median Station plan to achieve the following goals: • Provide a more direct pedestrian and bicycle route from the Transit Village pedestrian center to the eBART station, with a distance of no more than one-quarter mile, and the minimum number of grade changes; • Provide shorter, more direct vehicular access between the Transit Village Area to the eBART station; • Maximize developable land, especially properties with freeway visibility, and properties in the Transit Village Area; and • Provide an attractive view from the eBART station, that includes a direct line of sight to the Transit Village, and screens the view of the PG&E station; and • Maximize opportunities for shared parking between BART patrons and other land uses. C-36 Develop a multi-modal transit center at the median eBART station that provides access to eBART, buses, taxies, and shuttles. Design the transit facilities to include: • Bus transit center and approximately 8-12 bus bays (moved from the Hillcrest Park-and-Ride lot to the eBART Station parking area); • Kiss-and-ride limited term parking area; • Disabled parking; • Shuttle pick up and drop off area; and, • Safe and attractive pedestrian and bike crossings to the station. C-37 Work with Tri-Delta Transit to minimize impacts to existing service while serving the Station Area. C-38 Design arterials and arterial intersections, particularly near pedestrian-oriented streets, to accommodate transit services, including bus stops, pull-outs, and shelters.	
3.4-5	Implementation of the proposed Specific Plan would increase demand for parking.	LU-25 Work with BART to ensure that at least 1,000 parking spaces are provided in close proximity to the eBART Station by 2015, and that 2,600 spaces are provided by 2035. C-24 Locate off-street parking behind buildings or in structures, to the maximum extent feasible. Do not locate parking between public streets and building entrances, except on commercial retail sites within the freeway area. C-25 Maintain flexible parking standards that balance the need for parking with the broader Station Area goals of encouraging transit ridership, ridesharing, and nurturing the area's pedestrian appeal. C-26 Distribute parking throughout the Station Area to help balance traffic flow on the street grid network. C-27 Include on-street parking on collector and local streets, following detailed recommendations in Chapter 4, Urban Design.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		C-28 Adopt specific parking standards for the Station Area. Consider some or all of the following strategies to prevent oversupply and encourage the use of alternate modes of transportation: • Allow shared parking between uses with different peak periods of parking demand; • Reduce minimum off-street parking requirements for multi-family and commercial developments; • Adopt maximum off-street parking requirements; • Allow credits for adjacent on-street spaces; • Allow exemptions for small retail and dining establishments (e.g. less than 2,500 square feet) in pedestrian centers; and, • Allow tandem parking in residential developments. C-29 Work with property owners to emphasize shared parking arrangements where appropriate to maximize efficient use of parking resources. C-30 Incentivize parking structures, rooftop parking, and underground parking, through flexibility in conditions of approval and in negotiations for any City financial participation in the development. C-31 Require surface parking lots to be designed so that it is feasible to use them for other uses, such as farmers' markets or community events, without reducing the landscaping requirements. C-32 Identify opportunities for parking pricing strategies. Work with property owners to price parking so as to discourage automobile trips that could be made by other modes. C-34 Work with BART to identify funding sources for parking at the eBART stations, consistent with the following criteria: • 1,000 spaces at the time eBART service begins; and, • 2,600 spaces by 2030, if the Hillcrest Station continues to be the terminus station for the eBART service. These spaces may be developed in phases. I-2 Prior to final approvals of land subdivisions or development projects in the Transit Village and Freeway Areas, work with BART on a comprehensive eBART parking plan, which defines how eBART parking requirements for 1,000 spaces will be met when the Hillcrest Station opens, and how future eBART parking requirements of 2600 spaces can be met without reducing the available developable land in the Transit Village and Freeway areas.	
3.4-6	Implementation of the proposed Specific Plan will increase bicycling and walking.	C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish: • Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and, • Maximum block lengths of approximately 450 feet,	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block). C-3 Design streets so that they incorporate medians, landscaping, sidewalks, street trees, travel lanes, bike lanes, and on-street parking, such that they: • Are consistent with the desired pedestrian-oriented character and safety; and, • Meet the needs of all users including drivers, pedestrians, persons with disabilities, bicyclists, and transit users. C-39 Prioritize pedestrian and bicyclist safety at intersections and street crossings with measures such as: • Contrasting and/or textured paving crosswalks; • In-ground, blinking crosswalk lights; and, • Pedestrian refuges and bulb-outs. C-40 Implement a way-finding signage program for common destinations. C-41 Require development projects to provide walking and biking routes directly to major destinations such as parks, pedestrian centers, and eBART stations. C-42 Adopt minimum bicycle parking requirements for residential and commercial projects. Bicycle parking should be designed with the following criteria: • Short-term parking should be visible from the main entrance of buildings. • Long-term parking should be provided in secure, well-lighted areas. C-43 Encourage employers to provide showers and lockers. C-44 Limit the number of curb cuts allowed on each block face. C-45 On pedestrian-oriented streets, design streets and sidewalks consistent with the provisions in Chapter 4, Urban Design, including: • Tree wells or planter strips with trees between the sidewalk and parking; • On-street parking between sidewalks and travel lanes; • Pedestrian-scale street lights; • Limited curb cuts that cross the pedestrian path of travel; • Outdoor seating for restaurants and cafes; • Projections into the right of way for awnings, canopies, pedestrian-oriented signs, bay windows, and other elements that enhance the pedestrian realm; and C-46 Sidewalks should have at least a five-foot wide clear path of travel. C-47 Provide bike routes throughout the Station Area, as illustrated in Figure 3-5. • Class 1: Continuous multi-purpose trail along East Antioch Creek and the detention basins	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		• Class 2: Slatten Ranch Road, Phillips Lane, and Viera Avenue C-48 Allow bicycle circulation on all local streets, to the extent feasible. C-49 Design and implement a multi-use trail loop around the wetlands and East Antioch Creek. This loop should include at least two pedestrian crossings across the creek. C-50 Provide multi-use trails that connect from East Antioch Creek to existing neighborhood parks north of the Station Area. C-51 Provide at least two pedestrian and bicycle crossings across the railroad, at least one each in the Transit Village and the Town Center. If the Median Station is the selected eBART station location, provide a third pedestrian and bicycle crossing opposite the eBART station entrance, as shown in Figures 3-4 and 3-5. OS-8 Create a linear public open space at least 25 feet wide around the wetlands and detention basins. Design the open space consistent with the following criteria: • A multi-use trail 8-12 feet wide is provided around the perimeter of the 50-foot inner wetland buffer area; • The trail connects to public streets, public parks, and plazas; • At least two pedestrian and bike paths are available to cross the creek; • At least one staging area with parking is provided adjacent to the trail in the Transit Village area and one in the Town Center area; • Recreational facilities, such as seating, picnic tables, tot lots, and exercise areas or par course, are provided adjacent to the trail; • Viewing platforms may be built to observe the natural areas; and • If feasible, informational signage is provided so that the riparian habitat can used as an educational destination for local schools. UD-27 Create pedestrian and bicycle routes from the pedestrian centers of the Transit Village and Town Center to the eBART station(s) that are direct, safe, attractive and well-lit. Minimize the travel time and travel distance, and minimize the number of road crossings and the elevation changes such as tunnels, bridges, and ramps. UD-28 Incorporate bicycle and pedestrian facilities into the design of the railroad crossing at Viera Avenue and the design of Slatten Ranch Road, to create a comfortable and attractive pedestrian and bicycle route to eBART. If the railroad crossing is an undercrossing, minimize the width of the tunnel and maximize the daylight to the pedestrian/bicycle route. UD-29 If the East Median station location is selected for the eBART station, create a good quality pedestrian/bicycle connection from the Transit Village pedestrian center to the eBART station entrance.	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		• Design the Viera Avenue undercrossing/overcrossing to provide a reasonably straight pedestrian/bicycle connection to the eBART station entrance. • Incorporate a pedestrian path from the eBART station entrance to the Viera Avenue undercrossing (or overcrossing). • Provide a signalized pedestrian/bicycle crossing at Slatten Ranch Road, or a pedestrian/bicycle bridge. • The pedestrian and bicycle routes should be generally be consistent with the diagram shown in Figure 4-26: Pedestrian and Bicycle Route to eBART: East Median Station. • Conduct further studies to optimize the design of the Viera Avenue under-crossing, the Slatten Ranch Road/Viera Avenue intersection, and the pedestrian connections, in order to achieve good quality connections, and at the same time minimize costs and storm drainage pumping facilities. UD-30 If the Median Station location is selected for the eBART station, create a good quality pedestrian/bicycle connection from the Transit Village pedestrian center to the eBART station entrance. • Build a pedestrian/bicycle crossing over the railroad line, in a location that is generally in a straight line with the eBART station entrance. • Incorporate a pedestrian path from the eBART station entrance to the railroad crossing. • Provide a signalized pedestrian/bicycle crossing at Slatten Ranch Road. • The pedestrian and bicycle routes should be generally be consistent with the diagram shown in Figure 4-29: Pedestrian and Bicycle Route to eBART: Median Station.	
3.4-7	Construction of the Specific Plan elements would have temporary impacts on the environment if the project construction would substantially affect traffic flow, circulation, parking, and pedestrian safety.	C-23 Project sponsors shall develop a Construction Traffic Management Plan for City review and approval. The plan shall include at least the following items and requirements to reduce traffic congestion to the maximum extent feasible during construction: • A set of comprehensive traffic control measures, including major truck trips and deliveries that avoid peak traffic hours, detour signs if required, lane closure procedures, sidewalk closure procedures, signs, cones for drivers, and designated construction access routes. • Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur. • Location of construction staging areas for materials, equipment, and vehicles (must be located on the project site). • Identification of haul routes for movement of construction vehicles that minimize impacts on vehicular and pedestrian traffic, circulation and safety; • Temporary construction fences to contain debris	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		and material and to secure the site. • Provisions for removal of trash generated by project construction activity. • A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an onsite complaint manager. • Provisions for monitoring surface streets used for truck routes so that any damage and debris attributable to the trucks can be identified and corrected.	
3.5 Climate Change and Energy Use			
3.5-1	Implementation of the proposed Specific Plan would contribute to an increase in countywide greenhouse gas emissions.	EH-31 The City shall continue to work with the county, and other local, state, and federal governments, to develop a regional plan to reduce county geographical GHG emissions to 80 percent below current levels by 2050. I-19 The Transit Village Master Plan should ensure that the area north of the UP railroad within 0.5 miles of the eBART station complies with the criteria for transit priority projects, as defined by California Senate Bill 375 (and any subsequent updates.) I-20 The Town Center Master Plan should ensure that the area north of East Antioch Creek within 0.5 miles of either the Phillips Lane eBART station or shuttle stop for the Hillcrest eBART Station complies with the criteria for transit priority projects, as defined by California Senate Bill 375 (and any subsequent updates.) EH-32 Projects that receive financial assistance from the City or the Redevelopment Agency, including but not limited to assistance with public infrastructure, shall demonstrate the incorporation of energy efficiency measures beyond the minimum standards of Title 24 and the use of alternative energy sources such as solar power. EH-33 All electrical appliances installed in development projects in the Hillcrest Station Area shall be Energy Star rated. EH-34 All projects shall demonstrate that recycled materials have been incorporated into new construction. EH-35 Non-residential projects shall meet whichever standard is lower: • The current energy efficiency standard at the time that the development application is submitted, or • A 20 percent reduction in energy from the 2003 Title 24 Standards, consistent with Executive Order S-20-2004 issued by Governor Schwarzenegger. EH-36 Locate, orient, and shade the building, where feasible, as follows: • Provide exterior shade for south-facing windows during the peak cooling season. • Provide vertical shading against direct solar gain and glare due to low altitude sun angles for east- and west-facing windows. • When site and location permit, orient the building with the long sides facing north and south. • Protect the building from thermal loss, drafts, and	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		degradation of the building envelope caused by wind and wind-driven materials such as dust, sand, and leaves with building orientation and landscape features. • Wherever possible, use vegetation to shade buildings to limit direct solar gain and glare. C-1 Create a connected street network of arterials and collectors that connects with existing local and regional roadways, and provides circulation throughout the Station Area. C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish: • Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and, • Maximum block lengths of approximately 450 feet, or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block). C-6 Minimize cul-de-sacs to the maximum extent possible. Where cul-de-sacs are necessary due to barriers such as freeways and detention basins: • Provide at least one pedestrian and bicycle path at the circular end in order to connect to other streets and trails, to allow emergency vehicle access when warranted and to minimize response times for emergency access; and, • Consider designing cul-de-sacs with a planted cul-de-sac island to limit the amount of pavement and increase stormwater management opportunities. C-8 All applications for master plans, subdivisions, and development projects shall indicate how streets are connected to existing local and regional roadways, and how a connected network of streets is created throughout the Hillcrest Station Area. LU-3 Create a Transit Village in the western portion of the Hillcrest Station Area north of the Union Pacific Railroad right-of-way, with direct pedestrian, bicycle, bus transit, and automobile connections to the eBART station in the median of SR 4. LU-8 Develop a Town Center in the eastern portion of the Hillcrest Station Area that incorporates retail, entertainment, hospitality, and residential uses in a “lifestyle center” or other pedestrian-oriented format. LU-14 Allow compatible retail, restaurant, personal service, and other commercial uses within the Office TOD district. These uses must be on the ground floor and publicly accessible. LU-16 Up to 100 square feet of compatible retail, restaurant, personal service, office, and other commercial uses per residential unit is allowed within the Residential TOD district. These uses must be on the ground floor or second floor, and must be publicly accessible. LU-4 Locate high-density residential development within	

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Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		a half-mile walk from the eBART station. • A range of housing types may be included in a development project, some of which may be as low as 10 units per acre provided the total project meets the minimum density standard. • Residential units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts. LU-24 Locate eBART parking so that it is accessible to passengers arriving by car, bus, bicycle, or on foot. LU-27 Provide public bus facilities near each eBART station. C-3 Design streets so that they incorporate medians, landscaping, sidewalks, street trees, travel lanes, bike lanes, and on-street parking, such that they: • Are consistent with the desired pedestrian-oriented character and safety; and, • Meet the needs of all users including drivers, pedestrians, persons with disabilities, bicyclists, and transit users. C-36 Develop a multi-modal transit center at the median eBART station that provides access to eBART, buses, taxies, and shuttles. Design the transit facilities to include: • Bus transit center and approximately 8-12 bus bays (moved from the Hillcrest Park-and-Ride lot to the eBART Station parking area); • Kiss-and-ride limited term parking area; • Disabled parking; • Shuttle pick up and drop off area; and, • Safe and attractive pedestrian and bike crossings to the station. C-38 Design arterials and arterial intersections, particularly near pedestrian-oriented streets, to accommodate transit services, including bus stops, pull-outs, and shelters. C-39 Prioritize pedestrian and bicyclist safety at intersections and street crossings with measures such as: • Contrasting and/or textured paving crosswalks; • In-ground, blinking crosswalk lights; and, • Pedestrian refuges and bulb-outs. C-41 Require development projects to provide walking and biking routes directly to major destinations such as parks, pedestrian centers, and eBART stations. C-42 Adopt minimum bicycle parking requirements for residential and commercial projects. Bicycle parking should be designed with the following criteria: • Short-term parking should be visible from the main entrance of buildings. • Long-term parking should be provided in secure, well-lighted areas. C-46 Sidewalks should have at least a five-foot wide	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		clear path of travel. C-47 Provide bike routes throughout the Station Area, as illustrated in Figure 3-5. • Class 1: Continuous multi-purpose trail along East Antioch Creek and the detention basins • Class 2: Slatten Ranch Road, Phillips Lane, and Viera Avenue C-48 Allow bicycle circulation on all local streets, to the extent feasible. C-49 Design and implement a multi-use trail loop around the wetlands and East Antioch Creek. This loop should include at least two pedestrian crossings across the creek. C-50 Provide multi-use trails that connect from East Antioch Creek to existing neighborhood parks north of the Station Area. C-22 Apply a Transportation Demand Management (TDM) program that reduces single-occupant vehicle trips to development exceeding 25,000 square feet of non-residential space. Components of TDM programs could include: • Contributions to urban design projects, such as: - Bicycle parking, both short- and long-term, located in appropriate places; and, - Direct routes to transit (station, shuttle, or bus) and other key destinations that are well-lit and designed for pedestrian comfort. • Employer-based programs, such as: - Carpool and vanpool ride-matching services; - Designated employer TDM contact; - Guaranteed ride home for transit users and car/vanpoolers; - Transit subsidies for employees; - Flexible work schedules, shortened work weeks, or options to telecommute; - Information campaigns using brochures, boards/kiosks, or other communication outlets; and, - Employer provided showers and lockers. • Meeting or exceeding project design standards, such as: - Free and preferential parking for carpools, vanpools, low-emission vehicles, and car-share vehicles; - Passenger loading zones; and, - Bicycle- and pedestrian- friendly site planning and building design. UT-11 All new development shall participate in all solid waste source reduction and diversion programs in effect at the time of the issuance of building permits. UT-12 All projects in the Hillcrest Station Area shall comply with the City's Construction and Demolition Debris recycling regulations by preparing a Waste Management Plan and diverting at least 50 percent of all construction and	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		demolition debris. UT-13 Restaurants should use on-site composting systems if a food waste recycling program is not available. UT-14 Trees, stumps, vegetation, and soils associated with excavation and land clearing shall be composted, recycled, or reused, except when soils may be contaminated with hazardous materials, or where other conditions make this infeasible as determined by the City.	
3.6 Cultural Resources			
3.6-1	New development under the proposed Plan has the potential to adversely affect historic resources that appear on State historical inventories or may be eligible for inclusion on such lists.	EH-27 Require the project sponsor to complete the California Department of Parks and Recreation site forms for submittal to the California Archaeological Inventory located at Sonoma State University for each of the sites listed below. As part of the effort, require the project sponsor to complete focused historical archival research for the project area to chronicle historic development since the late 19th Century. This will help inform the determination of whether the sites are eligible to be designated as historic resources. • The "Foundry" (APN: 052-052-002) • 2500 Willow Lane • Two debris piles south of Oakley Road and east of Willow Road • Abandoned railroad spur EH-28 If any resource is found to be eligible for inclusion on the California Register of Historic Resources, the project sponsor shall consult with the State Historic Preservation Officer (SHPO) to document the existing condition, in order to establish for posterity a record of the historic property prior to its alteration, relocation, or demolition, and to identify any further requirements for environmental review and/or mitigation.	Less than Significant
3.6-2	New development within the Planning Area has the potential to disrupt undiscovered archaeological resources and human remains.		Less than Significant
3.6-3	Implementation of the proposed Specific Plan could adversely affect unidentified paleontological resources.		Less than Significant
3.7 Geologic and Seismic Hazards			
3.7-1	Proposed development in the Planning Area could expose people or structures to surface fault rupture.		Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
3.7-2	Proposed development in the Planning Area could expose people or structures to seismic hazards such as ground shaking or liquefaction.		Less than Significant
3.7-3	Implementation of the Hillcrest Station Area Specific Plan could expose proposed structures and infrastructure to geologic hazards, including expansive soils, differential settlement, and subsidence.		Less than Significant
3.7-4	Proposed development along the two southernmost hills adjacent to SR 4 could be susceptible to seismically-induced landslides or other slope failures, potentially resulting in damage to structures and private property.	EH-30 A slope stability analysis of the hillsides along the southernmost portion of the Planning Area shall be conducted prior to the issuance of any grading permits in this area. • If slope stability and/or landslides are expected to be an issue, the slope stability analysis shall recommend measures to ensure that future development projects in this area be designed and constructed to avoid seismically-induced landslides or other slope failures. Recommendations can include: • Requiring that the slope is cut at a flatter angle, such as 2.5:1 or 3:1 for slopes greater than 30 feet high; or, • Requiring that the slope is excavated and re-built as engineered fill buttress slopes inclined at 2:1 for slopes up to 30 feet high and inclined at 2.5:1 for slopes greater than 30 feet high. • Detailed grading plans and construction drawings incorporating the recommended measures shall be submitted to the City of Antioch Building Department for approval prior to the issuance of building permits.	Less than Significant
3.7-5	Future development in the Planning Area could result in increased soil erosion.		Less than Significant
3.8 Hazardous Materials, Wildland Fires, and Other Hazards			
3.8-1	Implementation of the Hillcrest Station Area Specific Plan could expose construction workers and/or the public to soil and groundwater impacted with petroleum-products, agriculture chemicals, or other	EH-37 Prior to approval of any discretionary permits for subdivisions or new construction, property owners shall work with the Contra Costa County Fire Protection District (CCCFPD), the Contra Costa County Health Services Department (CCCHSD), the California Department of Toxic Substances Control (DTSC), and/or the California Regional Water Quality Control Board (RWQCB), whichever has jurisdiction, to resolve issues related to contamination that could potentially impact future land uses in the project area. EH-38 For parcels with known contamination, the lateral	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
	hazardous materials.	and vertical extent of contamination shall be determined; cleanup activities shall be undertaken per state and federal regulations; and appropriate land use restrictions implemented, as necessary, prior to the issuance of development permits on parcels with known contamination. EH-39 As part of the project entitlement process, appropriate studies shall be conducted for each site with an open remediation case based on proposed land uses by a qualified environmental professional. The studies shall compare maximum soil, soil gas, and groundwater concentrations to relevant environmental screening levels (ESLs) and evaluate all potential exposure pathways from contaminated groundwater and soil. As required by the appropriate responsible agency, studies shall be prepared for the: • Former Hickson-Kerley (FKP) Property (APN: 052-051-034); • Chevron Old Valley Pipeline; • TAOC New Love Pump Station Site (APN: 052-051-034); and, • PG&E Oakley Metering Station (APN: 052-051-035) EH-40 At sites with known contamination issues, a Construction Risk Management Plan (RMP) shall be prepared and approved prior to commencement of construction, to protect the health and safety of construction workers and site users adjacent to construction activities. EH-41 Soil and water contamination assessments are required to ensure public health for projects on the following properties: • PDQ parcel (APN: 052-052-002); • Former orchards; • Parcels adjacent to the PG&E Substation property; • Parcels adjacent to the railroad right-of-way; • Parcels adjacent to active and inactive petroleum pipelines; • Park-n-ride lot (APNs: 052-011-009, 052-011-010, 052-011-011, 052-011-015, 052-011-016); and, • Detention basins (APN: 051-170-004, 051-170-053, 051-333-001, 052-030-022). EH-42 If soil or groundwater contamination is identified on any parcel in the Hillcrest Station Area, the lateral and vertical extent of contamination shall be determined; cleanup activities shall be undertaken per state and federal regulations; and appropriate land use restrictions implemented, as necessary, prior to issuance of development permits. EH-43 The City of Antioch and property owners shall contact and work with Union Pacific to ensure that planned railway improvements that disturb potentially contaminated soils do not impact nearby properties or development, or cause a public health hazard. EH-44 Project applicants shall submit to the City a project	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		Demolition Plan that addresses onsite and offsite chemical and physical hazards. The Demolition Plan shall contain: • Information, to be verified by the City prior to the issuance of demolition permits for any existing structures or buildings, regarding the presence of hazardous building materials such as asbestos-containing building materials, PCBs, and lead-based paint in existing buildings proposed for demolition, additions, or alterations; • Protocols for ensuring the safety of workers and the public during demolition or construction activities, as approved by the City. These protocols will include, but are not limited to: - Prior to demolition, hazardous building materials shall be removed and appropriately disposed of in accordance with all applicable guidelines, laws, and ordinances. - The demolition of buildings containing asbestos requires that licensed asbestos abatement contractors are retained and the Bay Area Air Quality Management District (BAAQMD) is notified ten days prior to initiating construction and demolition activities. - The Cal-OSHA-specified method of compliance for demolition activities involving lead-based paint including required respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, and training shall be required. - Any electrical transformers and fluorescent light ballasts that do not have labels stating that they do not contain PCBs, shall be treated as hazardous waste and are subject to all hazardous waste regulations. UD-20 Provide a continuous landscape buffer along both sides of the rail line corridor, outside of the Union Pacific and Chevron easements. The minimum width of the landscaped buffer shall be 25 feet if adjacent to a building; and 15 feet if adjacent to a street. • Include landscaping, berming (typically 4 to 5 feet high), and at least one continuous row of trees throughout the area. • This landscape buffer may be located within the Chevron easement if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project. UD-22 Provide a continuous landscape buffer, with a minimum width of approximately 25 feet, around the southern and eastern edges of the Hillcrest PG&E Substation. • Include landscaping and a continuous double row of trees to screen the facility from new development, SR 4, and the eBART station. • Work with PG&E when the company decides to expand substation operations within their site, to ensure an adequate separation is retained between the substation and development.	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
3.8-2	Future land uses proposed by the Hillcrest Station Area Specific Plan could involve the transport, use, and disposal of hazardous materials.		Less than Significant
3.8-3	Implementation of the proposed Specific Plan would expose people or structures to some risk of loss, injury, or death involving high-pressure pipeline incidents.	EH-54 Prior to the approval of development permits, require a disposition plan for all petroleum pipelines so that required mitigations (relocation, abandonment or protection) can be determined. EH-55 The City of Antioch and property owners shall work with Chevron to evaluate the risk factors related to the active high-pressure petroleum product pipelines, including product transported, operating pressure, age of pipeline, and depth of cover, and to provide adequate access to the oil pipelines in the Hillcrest Station Area. If it is determined that there is a significant risk to adjacent residential development, prepare a Risk Management Plan or comparable risk reduction action plan. UT-15 Develop a comprehensive map showing all existing service corridor and utility easements to ensure proper inter-agency coordination prior to issuing any grading permits. Maps should show the location and dimensions of each pipeline within the easement or right-of-way. Coordinate with: • Chevron to map all active and abandoned petroleum product pipelines; • PG&E to map all active natural gas pipelines; • City of Antioch Public Works Department to map all stormwater pipelines; • Delta Diablo Sanitation District to map all sewer pipelines; and, • Contra Costa Water District to map all water pipelines. UD-20 Provide a continuous landscape buffer along both sides of the rail line corridor, outside of the Union Pacific and Chevron easements. The minimum width of the landscaped buffer shall be 25 feet if adjacent to a building; and 15 feet if adjacent to a street. • Include landscaping, berming (typically 4 to 5 feet high), and at least one continuous row of trees throughout the area. • This landscape buffer may be located within the Chevron easement if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project. LU-23 Locate residential units away from railroads and freeways, to minimize impacts from noise and air emissions. Units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
3.8-4	Implementation of the proposed Specific Plan would expose people or structures to some risk of loss, injury or death involving urban or wildland fires.	UT-20 At the time of any development application, subdivision, or master plan submittal, inform the CCC Fire Protection District, and involve them in the development review process. Prior to approval of any discretionary development project in the area, require written verification from the CCC Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis. UT-21 Project sponsors are required to submit a minimum of three (3) copies of a site plan for each phase of development so that Contra Costa County Fire Protection District is able to determine the placement of fire hydrants, required fire flow, and review of access in order to ensure compliance with minimum requirements as set forth in the California Fire Code. UT-22 The City and project sponsors in the Planning Area shall work with the Contra Costa County Fire Protection District to provide a 1-acre building site at a location subject to approval by the Contra Costa County Fire Protection District. UT-23 Fire access roadways and fire hydrants shall be installed and in service prior to construction. UT-24 Traffic signals, which are installed or modified as part of this Specific Plan, shall have preemption devices (Opticom) installed.	Less than Significant
3.9 Hydrology and Water Resources			
3.9-1	Project construction activities could result in increased erosion and sedimentation, resulting in adverse impacts to water quality along East Antioch Creek and downstream waterbodies.	EH-45 Development projects in the Station Area shall comply with the requirements of Provision C.3 of the NPDES Municipal Stormwater Permit issued to the Contra Costa County Clean Water Program. As required by the C.3 Provisions, building permit applications must be accompanied by a Stormwater Control Plan, for review and approval by the City Engineer, which specifies the treatment measures and appropriate source control and site design features that will be incorporated into project design and construction to reduce the pollutant load in storm water discharges and manage runoff flows. EH-46 Design storm drainage and flood control structures to minimize erosion and creek sedimentation, and to preserve and enhance the wildlife habitat and vegetation of East Antioch Creek.	Less than Significant
3.9-2	New and increased intensity of urban land uses could result in increased levels of non-point source pollutants in storm water runoff, adversely affecting water quality in receiving waterbodies and East Antioch Creek.	Full compliance with NPDES C.3 Provisions and the proposed Plan policies listed under Impact 3.9-1 would ensure that impacts related to NPS pollutants and post-construction storm water quality are less than significant.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
3.9-3	Future development within FEMA 100-year flood hazard zones could pose significant risks to structures, human health, and private property.	UT-1 Prior to approval of any land subdivisions or development projects within the Hillcrest Station Area, a Drainage and Flood Management Master Plan shall be prepared in collaboration with Contra Costa County Flood Control and Water Conservation District, the City of Antioch Public Works Department, the City of Antioch Planning Department, and the City of Antioch Parks and Recreation Department. The Plan shall: • Document the overall drainage and flood control concept to be employed within the Hillcrest Station Area to ensure adequate and safe storm flows and to minimize flooding; • Address funding and responsibility for long-term maintenance of the flood control improvements; • Demonstrate how the natural hydrologic functions of the site are integrated with the storm drainage system and the overall site design, to the maximum extent feasible; and, • Identify how improvements can be phased for each development area. UT-2 Continue the Contra Costa County Flood Control and Water Conservation District Drainage Area Fee Program to fund flood control improvements in the Hillcrest Station Area. UT-3 Ensure that new development provides needed drainage and flood protection improvements in proportion to a project's impacts, to assure an equitable distribution of costs to construct and maintain drainage infrastructure. Construct new trunk mains along the backbone street alignments and provide connections into East Antioch Creek, as shown conceptually in Figure 6-2, Existing and Future Storm Drains. UT-4 Minimize total impervious areas by allowing narrow road sections and shared driveways, and using pervious materials on driveways, gutters, and off-street parking areas, where appropriate. C-7 Promote the use of permeable paving for parking aisles, off-street bike lanes, and parking lots, where feasible.	Less than Significant
3.9-4	Implementation of the Hillcrest Station Area Specific Plan would alter existing drainage patterns, potentially affecting the volume and/or timing of peak runoff in the municipal storm drain system.	Specific Plan policies listed under Impact 3.9-1 and 3.9-3 would contribute to reducing this impact to less than significant levels.	Less than Significant
3.9-5	Implementation of the Hillcrest Station Area Specific Plan could inhibit the infiltration of storm water runoff to groundwater, thereby reducing groundwater recharge and aquifer	Specific Plan policies listed under Impact 3.9-1 and 3.9-3 would contribute to reducing this impact to less than significant levels.	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
	volume.		
3.9-6	Construction activities and urban development resulting from implementation of the Hillcrest Station Area Specific Plan, in conjunction with other foreseeable development in the city, would not result in cumulatively considerable impacts on hydrology and water quality conditions.	Specific Plan policies listed under Impact 3.9-1 and 3.9-3 would contribute to reducing this impact to less than significant levels.	Less than Significant
3.10 Land Use			
3.10-1	The Plan proposes new policies and land use designations for areas covered by local and regional land use plans.		Less than Significant
3.10-2	The proposed Plan induces increased population and jobs through the development of new housing and commercial uses.		Less than Significant
3.11 Noise			
3.11-1	Development pursuant to the proposed Specific Plan could expose persons to or generate noise levels in excess of the City standards.	EH-47 Require developers to comply with relevant noise insulation standards contained in Title 24 of the California Code of Regulations (Part 2, Appendix Chapter 12A). EH-48 Require acoustical analysis performed by a licensed acoustical engineer to determine appropriate noise mitigations in order to meet the City's standards for projects as described below. Building permit applications shall demonstrate that noise mitigations are included in construction documents. • Residential projects within: - 730 feet of the SR 4 centerline; - 310 feet of the SR 160 centerline; - 170 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way; and, - 850 feet from the intersection of Hillcrest Avenue and the Union Pacific Mococo Rail Line (or the location(s) where freight trains sound horn). • Institutional and Office projects within: - 340 feet of the SR 4 centerline; - 150 feet of the SR 160 centerline; - 80 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way;	Significant and Unavoidable

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Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		- 400 feet from the intersection of Hillcrest Avenue and the Union Pacific Mococo Rail Line (or the location(s) where freight trains sound horn); - 30 feet of the eBART track centerline; and - 60 feet from the eBART at track crossovers ("frogs"). EH-49 Where projects in the Hillcrest Station Area incorporate noise mitigations and still cannot achieve City standards for exterior noise levels, as determined by acoustical analysis by a licensed acoustical engineer, project sponsors may apply for an exception to City exterior noise standards. • Such exception requests will be considered through a discretionary development entitlement process. • Projects requesting exceptions to exterior noise standards should demonstrate that: - (1) all feasible noise mitigations have been incorporated to lower exterior noise levels as close as possible to City standards; and - (2) noise mitigations that lower interior noise levels below the City and state standard of 45 dB have been incorporated, to compensate for the high exterior noise levels which make outdoor activities uncomfortable. EH-50 In new residential projects, provide noise buffers other than sound walls, such as vegetation, storage areas, or parking, and site planning and locating bedrooms away from noise sources. EH-51 Work with Union Pacific to minimize noise issues related to freight rail by implementing a grade separation at Hillcrest Avenue, and establishing a quiet zone through the Station Area. LU-23 Locate residential units away from railroads and freeways, to minimize impacts from noise and air emissions. Units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts.	
3.11-2	New development under the Specific Plan may result in exposure of people and noise-sensitive uses to temporary noise and vibration impacts related to construction activities.	EH-52 Require developers to mitigate noise exposure to sensitive receptors from construction activities. Mitigation may include a combination of techniques that reduce noise generated at the source, increase the noise insulation at the receptor, or increase the noise attenuation as noise travels from the source to the receptor (e.g., through the incorporation of barriers).	Less than Significant
3.11-3	Freight rail activity could expose existing and future development to groundborne vibration.	EH-53 Require vibration velocity analysis to determine appropriate mitigations for proposed: • Residential projects within 200 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way; • Institutional and Office projects within 120 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way; and,	Less than Significant

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		• High-sensitivity use projects (e.g. hospitals and medical labs) within 600 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way.	
3.12 Public Services			
3.12-1	Development pursuant to the adoption of the Hillcrest Station Area Specific Plan will require fire protection services that exceed current staffing and facilities.	UT-20 At the time of any development application, subdivision, or master plan submittal, inform the CCC Fire Protection District, and involve them in the development review process. Prior to approval of any discretionary development project in the area, require written verification from the CCC Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis. UT-21 Project sponsors are required to submit a minimum of three (3) copies of a site plan for each phase of development so that Contra Costa County Fire Protection District is able to determine the placement of fire hydrants, required fire flow, and review of access in order to ensure compliance with minimum requirements as set forth in the California Fire Code. UT-22 The City and project sponsors in the Planning Area shall work with the Contra Costa County Fire Protection District to provide a 1-acre building site at a location subject to approval by the Contra Costa County Fire Protection District. UT-23 Fire access roadways and fire hydrants shall be installed and in service prior to construction. UT-24 Traffic signals, which are installed or modified as part of this Specific Plan, shall have preemption devices (Opticom) installed.	Less than Significant
3.12-2	New development in the Hillcrest Station Area will require additional police services that exceed current staffing.	UT-25 Ensure that the Antioch Police Department has adequate police staff and equipment to serve the new development in the Hillcrest Station Area. UT-26 As part of new development applications, require a fiscal impacts analysis related to police services. The analysis must either demonstrate that total estimated tax revenues to the General Fund will pay for the total estimated cost of police services, or propose additional funding sources for ongoing police services to the Hillcrest Station Area. UT-27 Coordinate with the Antioch Police Department on project site design to increase public safety. Consider lighting and minimizing hiding spots in building and street design.	Less than Significant
3.12-3	New development under the proposed Hillcrest Station Area Specific Plan will increase the demand for school facilities.	UT-28 Require new development to pay all legally established fees or participate in land-based financing districts established by local school districts for the acquisition and development of school sites with adequate, permanent classroom space, as required by the local school district. UT-29 Prior to approval of any development projects or subdivisions that include residential units, the City and project applicants shall work with the Antioch Unified School District to identify any additional elementary school facilities	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		needed to serve students from the Planning Area. If it is determined that students from the project or subdivision will cause the capacity of the elementary school serving the Hillcrest Station Area to be exceeded, the City and the project sponsor shall work with AUSD to provide the additional required facilities prior to occupancy of the residential units.	
3.12-4	Implementation of the Hillcrest Station Area Specific Plan would result in an increase in the use of existing neighborhood and regional parks and would increase the demand for parkland.	OS-1 Prepare parks plans as part of the required Master Plans for the Transit Village and Town Center areas, in order to meet the recreational needs of the residents and employees of the Station Area. The parks components of the Master Plans should fulfill the following criteria: • An integrated network of public open spaces, parks, plazas, and trails should be created to connect the Transit Village, Town Center, and existing neighborhoods. • Open space types and locations should be generally consistent with Figure 3-6. • All new employees and residents should be within a five- to ten-minute walk of a park or plaza. • For all new public parks, the design, program, and facilities must be approved by the City. OS-2 Park and open space land must be provided as part of new development. Park dedication requirements will be based on the number of units and size of residential units proposed in an individual development project, following the provisions of the City's ordinances. With City approval, impact fees may be paid in lieu of park dedication for small properties where no parks are shown on the Open Space Plan. • In the Transit Village area, provide a small neighborhood park approximately two acres in size within walking distance of the residential units. This park could be located adjacent to the East Antioch Creek Linear Park trail. • In the Town Center area, provide a neighborhood park approximately three acres in size, with at least one sports field. OS-3 Provide a comprehensive maintenance program for all open spaces, parks, plazas, and landscape buffers. Any parks or open spaces less than five acres in size should be maintained by private property owners, rather than by the City of Antioch, using mechanisms such as Homeowners' Associations (HOAs) or Street Lighting and Landscaping Maintenance Districts (LLMDs). OS-6 Project sponsors may apply for partial credit of park requirements by improving utility easement landscape buffers with trails, benches, and other recreational amenities. OS-7 Connect trails and parks to the City's existing trail network. OS-8 Create a linear public open space at least 25 feet wide around the wetlands and detention basins. Design the open space consistent with the following criteria: • A multi-use trail 8-12 feet wide is provided around	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		the perimeter of the 50-foot inner wetland buffer area; • The trail connects to public streets, public parks, and plazas; • At least two pedestrian and bike paths are available to cross the creek; • At least one staging area with parking is provided adjacent to the trail in the Transit Village area and one in the Town Center area; • Recreational facilities, such as seating, picnic tables, tot lots, and exercise areas or par course, are provided adjacent to the trail; • Viewing platforms may be built to observe the natural areas; and • If feasible, informational signage is provided so that the riparian habitat can used as an educational destination for local schools. OS-9 Improve the creek and wetlands so that they are visually attractive, and at the same time protect wildlife habitat, movement corridors, special status species, and stormwater management functions, consistent with the criteria below. • Any creek, wetland, and wetland buffer improvement must be reviewed and approved by a certified biologist. • Appropriate types of fencing must be provided between the wetlands and the park areas to ensure that pets and children do not disturb sensitive habitats. • Plants must be native and appropriate to East Antioch Creek. OS-10 Development sponsors may apply for credit toward a portion of the park land dedication requirements for creek and wetlands restoration and/or improvements. OS-11 Improve areas around the detention basins with trails, trees, landscaping, and other amenities so they become an integral and attractive portion of the open space network within the Station Area. OS-12 Incorporate public plazas in commercial and mixed use development within the pedestrian center areas. Plazas should be designed consistent with the following criteria: • The size of the plaza is to be commensurate with the size of the development project and the height and scale of the buildings. • Plazas must be located adjacent to a public street. • Plazas must be open to the public during all daylight hours. • Plazas must be located generally adjacent to retail and restaurant uses, rather than primarily office uses. • Both paved areas and landscaping must be included, and seating and areas for interaction must be provided. • A variety of flexible seating options (ledges, steps, or movable chairs), water features or art, connectivity to the	

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		street, environmental protection, and access to food (food carts or adjacent cafés) must be provided.	
3.12-5	Implementation of the Hillcrest Station Area Specific Plan would result in an increase in demand for community center space.	UT-31 Provide adequate community center space for new residents, either in development projects or through an in-lieu fee. • Community center space must serve all the residents of the City, and be programmed with activities that meet the unmet needs of the Antioch community. • Exempt ground floor public community center space from floor area ratio (FAR) limits in mixed-use development projects. UT-32 Exempt the floor area devoted to daycare and childcare from floor area ratio (FAR) limits in development projects.	Less than Significant
3.13 Utilities			
3.13-1	Expected buildout of the Hillcrest Station Area will increase demand for potable water in the Planning Area and will require the expansion of the municipal water distribution system.	UT-5 Expand the water distribution system such that it is adequate to serve new development in the Hillcrest Station Area, as conceptually illustrated in Figure 6-3, Existing and Future Water System. UT-6 Work with the Contra Costa County Fire Protection District to determine required fire flow and the need for water pressure boosting systems. UT-7 To reduce water consumption, require the installation of: • Low-flow showerheads, faucets, and toilets; • Low-flow irrigation systems in public rights-of-way, public parks, and recreation areas; and, • Drought-tolerant plant palettes in all new streetscape areas. UT-8 To reduce water consumption, recommend the installation of: • Low-flow irrigation systems in private landscaped areas; and • Drought-tolerant plant palettes in private landscaped areas.	Less than Significant
3.13-2	Implementation of the proposed Specific Plan would increase urban runoff and require the expansion of the municipal stormwater management system.	UT-1 Prior to approval of any land subdivisions or development projects within the Hillcrest Station Area, a Drainage and Flood Management Master Plan shall be prepared in collaboration with Contra Costa County Flood Control and Water Conservation District, the City of Antioch Public Works Department, the City of Antioch Planning Department, and the City of Antioch Parks and Recreation Department. The Plan shall: • Document the overall drainage and flood control concept to be employed within the Hillcrest Station Area to ensure adequate and safe storm flows and to minimize flooding; • Address funding and responsibility for long-term maintenance of the flood control improvements; • Demonstrate how the natural hydrologic functions of the site are integrated with the storm drainage system and the overall site design, to the maximum extent feasible; and,	Less than Significant

Table E-6 Summary of Impacts and Proposed Specific Plan Policies that Reduce the Impact

Impact #	*Impact Statement*	*Proposed Specific Plan Policies that Reduce the Impact*	*Significance*
		• Identify how improvements can be phased for each development area. UT-2 Continue the Contra Costa County Flood Control and Water Conservation District Drainage Area Fee Program to fund flood control improvements in the Hillcrest Station Area. UT-3 Ensure that new development provides needed drainage and flood protection improvements in proportion to a project's impacts, to assure an equitable distribution of costs to construct and maintain drainage infrastructure. Construct new trunk mains along the backbone street alignments and provide connections into East Antioch Creek, as shown conceptually in Figure 6-2, Existing and Future Storm Drains. UT-4 Minimize total impervious areas by allowing narrow road sections and shared driveways, and using pervious materials on driveways, gutters, and off-street parking areas, where appropriate. EH-45 Development projects in the Station Area shall comply with the requirements of Provision C.3 of the NPDES Municipal Stormwater Permit issued to the Contra Costa County Clean Water Program. As required by the C.3 Provisions, building permit applications must be accompanied by a Stormwater Control Plan, for review and approval by the City Engineer, which specifies the treatment measures and appropriate source control and site design features that will be incorporated into project design and construction to reduce the pollutant load in storm water discharges and manage runoff flows. EH-46 Design storm drainage and flood control structures to minimize erosion and creek sedimentation, and to preserve and enhance the wildlife habitat and vegetation of East Antioch Creek.	
3.13-3	Expected buildout of the proposed Specific Plan will require the expansion of the municipal wastewater collection system.	UT-9 Expand the wastewater collection system such that it is adequate to serve new development in the Hillcrest Station Area, as conceptually illustrated in Figure 6-4, Existing and Future Sewer System. The 2003 Wastewater Collection System Master Plan identifies the sewer main on the eastern edge of the Planning Area between the Union Pacific Railroad tracks and East 18th as needing substantial additional capacity. UT-10 Amend sewer fees and/or other financing mechanisms if necessary such that Hillcrest Station Area project sponsors pay their fair share of the costs for sewer main improvements.	Less than Significant

1 Introduction

This Program Environmental Impact Report (EIR) has been prepared on behalf of the City of Antioch in accordance with the California Environmental Quality Act (CEQA). This chapter outlines the purpose of and the overall approach to the preparation of the EIR on the Hillcrest Station Area Specific Plan. The City of Antioch is the lead agency responsible for ensuring that the Specific Plan complies with CEQA.

1.1 PURPOSE OF EIR

The Hillcrest Station Area Specific Plan consists of policies and proposals to guide the future growth within the Hillcrest Station Area, referred to in this document as the Planning Area (see Chapter 2: Project Description for discussion and map). This Draft EIR evaluates the potential impacts of the adoption of the proposed Specific Plan. This EIR will also be used as a reference for subsequent environmental review of infrastructure improvements, zoning amendments, impact fees and development proposals. The City will determine whether the environmental effects of any proposed projects are addressed by this EIR, and may require additional environmental analysis, revisions to the project, conditions of approval, and/or mitigation measures.

The EIR on the proposed Plan has three purposes:

- First, the EIR will help the City of Antioch meet California Environmental Quality Act (CEQA) requirements for analysis of environmental impacts by including a complete and comprehensive programmatic evaluation of the physical impacts of the proposed Hillcrest Station Area Specific Plan and its alternatives.
- Second, the EIR will inform residents and members of the City Council and Planning Commission of the environmental impacts prior to the Commission and Council taking action on the Plan. This information will assist City officials in reviewing and adopting the proposed Plan.
- Third, the EIR will assist local decision-makers in determining appropriate amendments to Antioch's land use regulations and other implementation actions, based on a balanced assessment of the environmental impacts of the Plan.

CEQA requires that the agency with the primary responsibility over the approval of a project (the lead agency) evaluate the potential impacts of the project in an EIR. The City is required to prepare an EIR on the Hillcrest Station Area Specific Plan in order to provide the City Council, as the ultimate decision-making body, with an informational document for use in evaluating the proposed Plan. After adoption, the EIR will serve the additional function of providing direction to the City in implementation of the new Plan. The EIR also evaluates reasonable alternatives to the proposed Plan.

In addition to evaluating the Plan, the EIR evaluates a "No Project Alternative" and one additional alternative to the proposed Plan. The "No Project Alternative" discusses the result of not implementing the proposed Hillcrest Station Area Specific Plan. The other alternative evaluates an alternative with a lower intensity of development. This alternative is identified as the environmentally superior alternative; however it does not fully meet the project objectives for compact transit-oriented development, and does not mitigate impacts to a less than significant level.

1.2 INTENDED USE OF EIR

This Draft EIR will be used by Antioch residents, elected officials, and City staff during the public review process to evaluate the potential environmental impact of the proposed Hillcrest Station Area Specific Plan. The Draft EIR and Final EIR, which includes responses to public comments received during the 45-day comment period, will be certified by the Antioch City Council prior to consideration of the proposed Hillcrest Station Area Specific Plan.

1.3 SPECIFIC PLAN PROCESS AND PUBLIC INVOLVEMENT

The City of Antioch, in partnership with the Dyett & Bhatia consulting team, led the planning process for the Hillcrest Specific Plan. The other team members included Economic Planning Systems (market and financing analysis), Fehr & Peers (transportation analysis), BKF (infrastructure analysis), ESA (environmental analysis), and Charles M. Salter Associates Inc (noise analysis). BART and Brosamer & Wall, a major property owner, also contributed to the plan by providing data and studies relevant to the area. The process has taken approximately eighteen months.

The planning process began with researching the issues, opportunities, and constraints through field visits and evaluating relevant planning documents and studies. The *Existing Conditions, Opportunities, and Constraints Report* summarized the results. Individual stakeholders were interviewed to provide additional context and understanding of the vision for the area. The *Stakeholder Interviews Summary Report*, reviews the major topics and information gathered during the initial outreach phase. A *Market Overview and Absorption Projections Report* was also prepared, analyzing the market demand and absorption potential for residential, retail, and office uses. All three documents are available for review at the City's Economic Development Department.

The next stage involved drafting alternative land use and circulation diagrams and evaluating potential traffic, environmental, and market impacts. Meetings with the City Council, consulting team, city staff, and property owners provided feedback in order to refine the diagrams. City Council Study Sessions were conducted on May 20, July 8, and October 28, 2008. The alternative diagrams and draft project description were presented to the Planning Commission as part of the Environmental Impact Report scoping session on June 18, 2008. A community workshop, attended by approximately 50 residents and interested parties, was conducted on September 18, 2008. Comments and concerns expressed at the workshop were incorporated into the plan diagrams and draft plan policies.

Another public workshop was conducted at the Planning Commission meeting on December 3, 2008 to garner feedback community members about the plan policies, final plan diagrams, and the

draft implementation program. The diagrams, development summaries, and plan policies were finalized as part of the Draft Specific Plan. These elements were incorporated into the Draft Environmental Impact Report. The public review drafts of the Plan and Draft EIR were released in January 2009. The draft documents were reviewed by the Planning Commission and the City Council in January and February 2009. The final documents were prepared and presented at hearings in March and April 2009.

The Specific Plan includes a general implementation program based on necessary infrastructure and public services that includes general phasing and planning. In addition, the regional planning agencies, the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), awarded the City of Antioch a grant to pursue a more detailed Infrastructure Financing and Phasing Plan to support the Hillcrest Station Area Plan. The Infrastructure Financing and Phasing Plan is a separate document and will act as the financing implementation mechanism of the Specific Plan.

Table 1-1 Specific Plan Process

Task 1:	Identify Issues, Opportunities, and Constraints
Task 2:	Community Outreach
Task 3:	Station Area Plan Alternatives
Task 4:	Revised Alternatives
Task 5:	Final Alternatives and Development Standards
Task 6:	Implementation Program
Task 7:	Draft Station Area Specific Plan and Draft EIR
Task 8:	Adoption of Final Plans and Final EIR
Task 9:	Infrastructure and Costs Analysis
Task 10:	Financing Strategy
Task 11:	Infrastructure Financing and Phasing Plan

1.4 APPROACH TO THE STUDY

A program EIR is defined in the CEQA Guidelines Section 15168 as: "...an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either: (1) geographically; (2) as logical parts in the chain of contemplated actions; (3) in connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or (4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental impacts which can be mitigated in similar ways."

Program EIRs can be used as the basic, general environmental assessment for an overall program of projects developed over the planning horizon, which is expected to be through 2035. A program EIR has several advantages. First, it provides a basic reference document to avoid unnecessary repetition of facts or analysis in subsequent project-specific assessments. Second, it allows the lead agency to look at the broad, regional impacts of a program of actions before its

adoption and eliminates redundant or contradictory approaches to the consideration of regional and cumulative impacts.

As a program EIR, this document focuses on all effects of the proposed Hillcrest Station Area Specific Plan; the analysis does not examine the effects of potential site-specific projects that may occur under the overall umbrella of this program in the future. When specific development proposals for the Planning Area are submitted to the City, the City will determine whether the environmental effects of the proposed projects are addressed by this EIR. If the City finds that the proposals would not result in any additional environmental impacts beyond those considered in this EIR, no new environmental analysis would be required. If the City determines that a project would create potential environmental impacts not studied in this EIR, or that environmental conditions have changed substantially since the EIR was prepared, the City could require further environmental review to determine appropriate revisions to the project, conditions of approval, or mitigation measures.

In order to place many of the proposed Specific Plan policies into effect, the City will adopt or approve specific actions—zoning regulations, redevelopment plan amendments, zoning map amendments, development impact fees, capital improvement programs, development projects, etc.—that are consistent with the policies and implementation measures of the Plan.

CEQA mandates that lead agencies adopt mitigation monitoring and reporting programs for projects identified as having significant impacts where mitigation measures have been identified. Mitigation monitoring and reporting programs are intended to ensure compliance during project implementation. These programs provide the additional advantages of providing staff and decision-makers with feedback as to the effectiveness of mitigation measures, as well as the experience and information to shape future mitigation measures.

The proposed Hillcrest Station Area Specific Plan is intended to be generally self-mitigating, in that the policies and programs of the proposed Plan are designed to reduce potential environmental impacts. This EIR clearly shows how the impacts of future development in the Plan area will be reduced through implementation of the policies and programs of the proposed Plan. Any residual impact after implementation of these proposed policies and programs is identified and measured against the significance criteria established for each impact area. The significance criteria is an identifiable quantitative, qualitative, or performance level of a particular environmental effect in which non-compliance indicates that the effect is significant.

This EIR represents the best effort to evaluate the potential environmental effects of the proposed Hillcrest Station Area Specific Plan given its long-term planning horizon. It can be anticipated that conditions will change; however, the assumptions used are the best available at the time of preparation and reflect existing knowledge of patterns of development and travel patterns.

The proposed Hillcrest Station Area Specific Plan EIR is based on the following key assumptions:

- **Full Implementation.** This EIR assumes that all policies in the proposed Hillcrest Station Area Specific Plan will be fully implemented and all development will be consistent with the proposed Land Use Plan.

- **Buildout in 2035.** This EIR assumes that the majority of development and redevelopment under the proposed Hillcrest Station Area Specific Plan will occur within 27 years. This is the timeline or planning horizon for this analysis. It is understood that development under the proposed Hillcrest Station Area Specific Plan will be incremental and timed in response to market conditions. Key assumptions about buildout development intensities and densities are further defined in the Project Description.

1.5 SCOPE OF EIR

The issues evaluated in this EIR were determined during the initial phase of the project. A Notice of Preparation (NOP) for the EIR on the Hillcrest Station Area Specific Plan was circulated in June 2008 (received at the State Clearinghouse June 2, 2008) and the City received comments during a 30-day review period. The NOP and comments on that NOP received by the City are in Appendix A of this EIR. An environmental review scoping meeting was held at Antioch City Hall on June 18, 2008. NOP comments, along with input received during public workshops and meetings, helped to identify the major planning and environmental issues and concerns in the Hillcrest Station Area Specific Plan and establish the framework and focus of the environmental analysis.

The first step toward completion of this Draft EIR was the initial analysis of the environmental setting. This analysis compiled specific information on the current conditions of the Planning Area, its characteristics, and the major issues it faces. Information on the environmental setting provides background regarding relevant issues and is used to evaluate potential impacts. Based on the initial analysis of the environmental setting, as well as the NOP comments and public meetings, the following issues are analyzed in this EIR:

- Aesthetics and Visual Resources
- Air Quality
- Biological Resources
- Circulation and Traffic
- Climate Change
- Cultural Resources
- Geologic and Seismic Hazards
- Hazardous Materials and Safety
- Hydrology and Water Resources
- Land Use and Population
- Noise
- Public Services
- Utilities

Each potential impact is addressed in Chapter 3: Settings, Impact Analysis, and Mitigation, of this EIR.

1.6 DOCUMENTS INCORPORATED BY REFERENCE

Section 15150 of the CEQA Guidelines permits documents of lengthy technical detail to be incorporated by reference in an EIR. Specifically, Section 15150 states that an EIR may "incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public...." Incorporated documents are to be briefly summarized in the EIR and be made available to the public for inspection or reference. The Hillcrest Station Area Specific Plan Draft EIR incorporates by reference the documents noted below, which are available at the City of Antioch, Economic Development Department, 3rd and "H" Streets, Antioch, CA 94509:

- **Antioch General Plan Update, 2003**. The Antioch General Plan encompasses a comprehensive strategy for managing the community's future. The Antioch General Plan is the community's statement of what is in its interest, and is the City's most important statement regarding its ultimate physical, economic, and cultural development over the next 25 years (2028).
- **Antioch General Plan Update EIR, July 2003.** The environmental impact report for the General Plan analyzes its buildout and impacts, and lists required mitigation measures.
- **Hillcrest Station Area Draft Specific Plan, January 2009**. The Draft Specific Plan contains the background, goals, policies, standards, and guidelines to develop the Planning Area according to the broad vision and details determined with the City, stakeholders, and economic and environmental experts. The Draft Plan includes an implementation program that names implementation projects and programs, and the public agencies responsible for them. The Draft Plan has been distributed for public review.
- **East Contra Costa BART Extension (eBART) Draft EIR, September 2008**. This EIR includes qualitative and quantitative environmental review of the eBART corridor and the impacts of the proposed eBART project. The proposed eBART project includes building one transit station in the median of SR 4 near the Hillcrest Avenue and SR 4 interchange.

1.7 ORGANIZATION OF EIR

The Draft EIR is organized into the following main chapters:

Chapter 2: Project Description. This chapter includes a detailed description of the proposed Hillcrest Station Area Specific Plan. The proposed Plan diagrams, proposed land use classification systems, buildout estimates, key policies, and implementation program are presented.

Chapter 3: Environmental Setting, Impact Analysis, and Mitigation. This chapter analyzes the environmental impacts of the proposed Hillcrest Station Area Specific Plan. Impacts are organized by major topic. Each topic area includes a description of the environmental setting, significance criteria, impacts, and mitigation measures. Policies in the proposed Hillcrest Station Area Specific Plan that would avoid or reduce the impacts are also discussed.

Chapter 4: Analysis of Alternatives. This chapter compares the impacts of the proposed Plan with a "No Project" scenario based on the current General Plan, and an Alternative Plan with a lower intensity of development.

Chapter 5: CEQA-Required Conclusions. This chapter reviews the growth-inducing and cumulative impacts of the proposed Plan as well as its significant environmental effects.

The Draft EIR also includes a bibliography (Chapter 6), a list of persons and organizations consulted (Chapter 7), the report authors (Chapter 8), a glossary of terms (Chapter 9), and a list of acronyms (Chapter 10). Various technical reports are also included in the Draft EIR in the Appendix.

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2 Project Description

The project analyzed in this EIR is the proposed *Hillcrest Station Area Specific Plan*, hereafter referred to as the proposed Plan. The Plan proposes transit-oriented residential and commercial development in the area of the proposed eBART station(s) near Hillcrest Avenue in Antioch, California.

The project includes the Hillcrest Station Area Specific Plan, as well as the subsequent actions needed to implement the Plan and make it consistent with existing plans and regulations. The City will adopt an amendment to the Antioch General Plan concurrently with adoption of the proposed Plan. The General Plan amendment will include changes to the Land Use and Circulation Elements. Implementation of the proposed Plan will also include, but is not limited to, such tasks as amending the City of Antioch Zoning Ordinance and Map, updating the City's Capital Improvements Program (CIP), and establishing development impact fees.

This chapter provides background information regarding the regional location and boundaries of the Hillcrest Station Area Specific Plan, as well as the policy development process, objectives, and key themes and components of the proposed Plan. Additional details are provided in the Plan itself. This project description provides the basis for the environmental analysis in Chapter 3.

2.1 REGIONAL LOCATION AND PLANNING BOUNDARIES

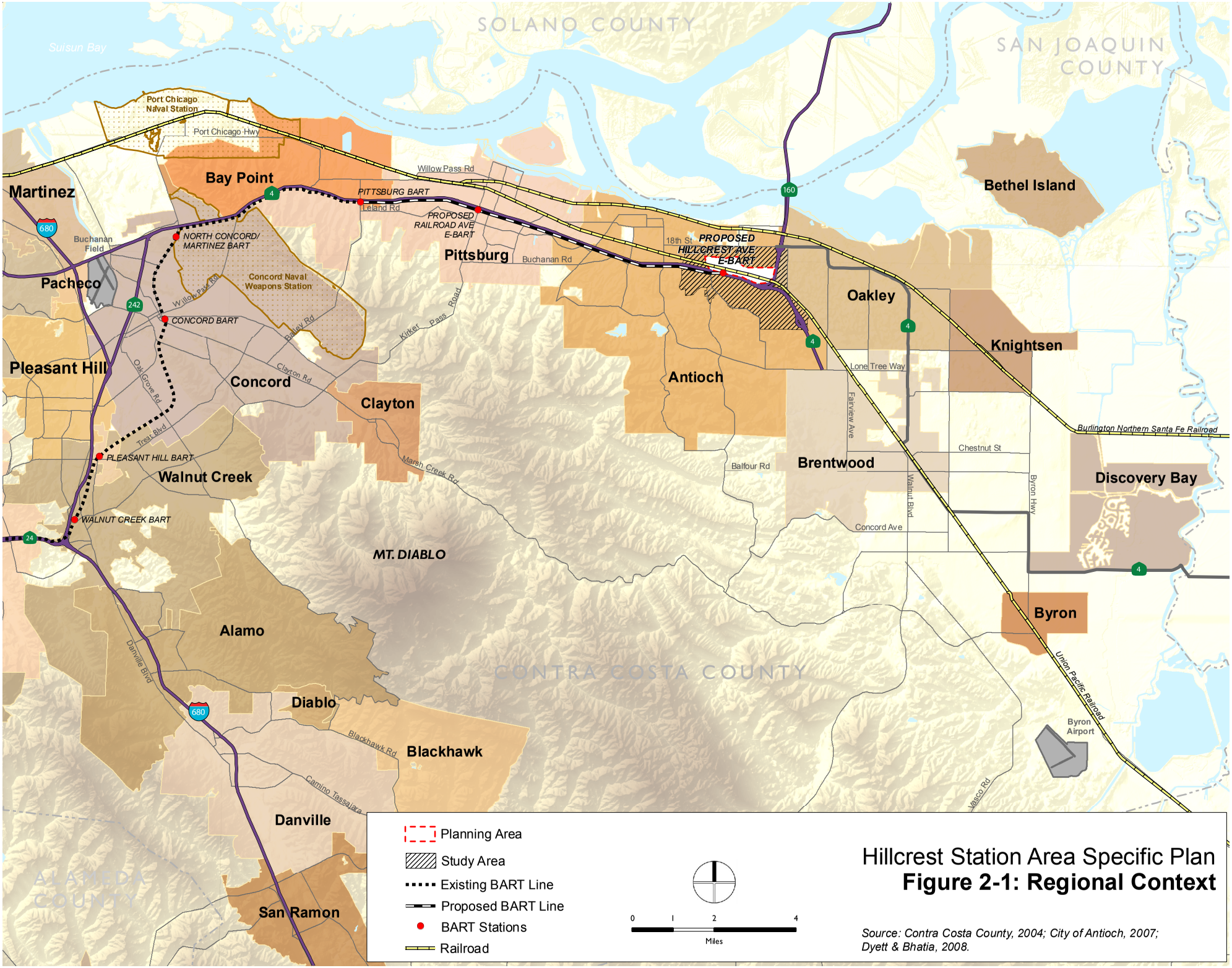
HILLCREST STATION AREA LOCATION

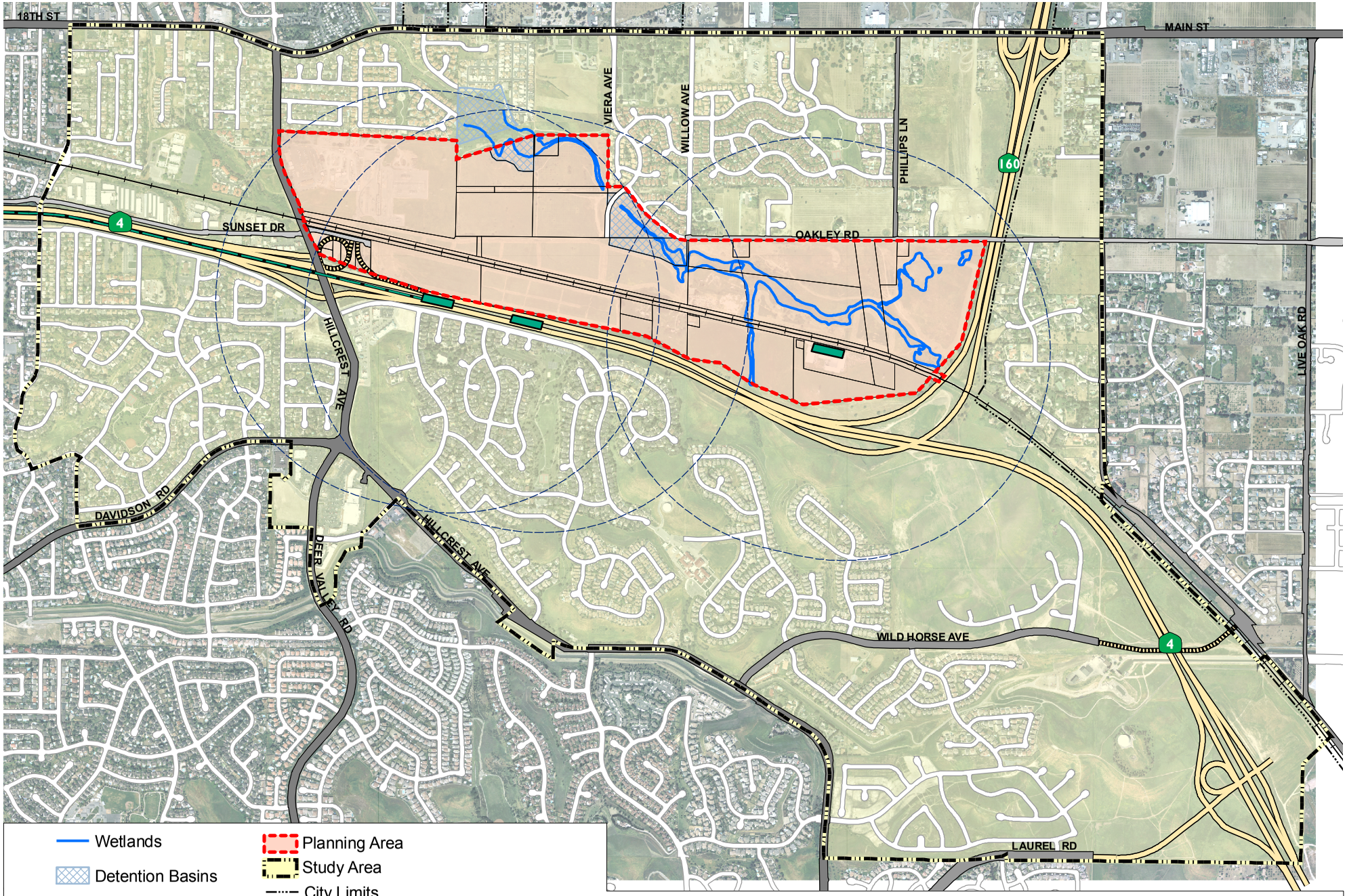
The Hillcrest Station Area is located in East Contra Costa County in northeastern Antioch, as shown on the Regional Context map, Figure 2-1. To the west of the Station Area are the communities of Pittsburg, Concord and Walnut Creek, which are major employment destinations. To the east are the communities of Oakley, Brentwood and Discovery Bay, which have experienced rapid growth in their residential sectors over the past ten years.

Figure 2-2 illustrates the Planning and Study areas for the Specific Plan. The Planning Area is a generally rectangular 375-acre area at the junction of Highway 4 (SR 4) and Highway 160 (SR 160). A Study Area has also been illustrated in order to evaluate circulation and access to the site and to the future eBART station. This Study Area is defined by the major arterials that would be used to access the Planning Area.

CONTRA COSTA COUNTY

East Contra Costa County is one of the fastest growing areas of the San Francisco Bay Region. Between the years 2005 and 2030, more than 32,000 households and 47,000 jobs are expected to be added in the four communities of Antioch, Brentwood, Oakley, and Pittsburg alone. In addition, more houses and jobs will be added to the unincorporated areas of the County (ABAG, 2007).


SOLANO COUNTY
SAN JOAQUIN COUNTY
CONTRA COSTA COUNTY
ALAMEDA COUNTY
Suisun Bay
Port Chicago Naval Station
Port Chicago Hwy
Martinez
Bay Point
Willow Pass Rd
PITTSBURG BART
Leland Rd
PROPOSED RAILROAD AVE E-BART
Pittsburg
Buchanan Rd
18th St
PROPOSED HILLCREST AVE E-BART
Bethel Island
Buchanan Field
NORTH CONCORD/ MARTINEZ BART
Concord Naval Weapons Station
Pacheco
Willow Pass Rd
CONCORD BART
Kirker Pass Road
Bailey Rd
Oakley
Knightsen
Pleasant Hill
Oak Grove Rd
Clayton Rd
Concord
Clayton
Antioch
Lone Tree Way
Fairview Ave
Burlington Northern Santa Fe Railroad
Chestnut St
Balfour Rd
Brentwood
Walnut Blvd
Byron Hwy
Discovery Bay
Treat Blvd
PLEASANT HILL BART
Walnut Creek
Marsh Creek Rd
WALNUT CREEK BART
Concord Ave
MT. DIABLO
Byron
Alamo
Danville Blvd
Union Pacific Railroad
Byron Airport
Diablo
Blackhawk Rd
Blackhawk
Camino Tassajara
Vasco Rd
Danville
San Ramon
Planning Area
Study Area
Existing BART Line
Proposed BART Line
BART Stations
Railroad
0 1 2 4
Miles
Hillcrest Station Area Specific Plan
Figure 2-1: Regional Context
Source: Contra Costa County, 2004; City of Antioch, 2007; Dyett & Bhatia, 2008.



Hillcrest Station Area Specific Plan

Figure 2-2: Planning Area & Study Area

Source: Contra Costa County, 2004; City of Antioch, 2007; Dyett & Bhatia, 2008.

As East Contra Costa County continues to add households and jobs, traffic delay and congestion on SR 4 and on the few alternative street and highway routes available to commuters are expected to increase dramatically. Many of the East County residents travel west to get to work each day, causing serious traffic congestion on SR 4, the only east-west highway in East County. Caltrans and regional transportation agencies are currently expanding SR 4 and building the SR 4 Bypass to help accommodate traffic.

CITY OF ANTIOCH

With a population of 100,500 people, Antioch offers a variety of employment, shopping and recreational activities. Land remains plentiful and affordable, compared with other parts of the Bay Area. Antioch is one of the few Bay Area communities that offers affordable housing. There are a variety of house styles throughout Antioch, from condominiums to single unit residences, priced for a variety of income levels. New development over the last 20 years has been predominantly single-family housing. The pace of development in Antioch has spurred activity for financial and insurance institutions, contractors, and other types of service-oriented businesses. Increased development has created increased employment in schools, hospitals, retail and other local service sectors.

The Bay Area Association of Governments (ABAG) estimates that Antioch will grow to 124,000 population and 36,750 jobs by 2030. (2007) Major employers in the City include Antioch Unified School District, Sutter Delta Medical Center, Kaiser Permanente, Contra Costa County Department of Social Services, and Wal-Mart.

2.2 PURPOSE AND OBJECTIVES OF THE PROPOSED PLAN

PLAN PURPOSE

The Hillcrest Station Area Specific Plan will serve as the land use regulatory document that will govern the development of the Planning Area. It will also meet the requirements of a Ridership Development Plan (RDP) as required by BART (Bay Area Rapid Transit) and the Metropolitan Transportation Commission (MTC) for evaluation and construction of the eBART line. The Specific Plan also contains an implementation program (Chapter 7), which will enable the City of Antioch to take specific steps to facilitate the development of the area.

PLAN OBJECTIVES

The Planning Area presents a tremendous opportunity for high quality, transit-oriented development with great visibility from two freeways. The proposed Plan presents a strategy for creating a mixed-use community that includes high-density housing, new office and commercial development, and a well-planned, linked circulation and infrastructure backbone. The area can be transformed into a signature area of Antioch, with high quality development and interesting pedestrian areas that add to the City's quality of life. The key objectives of the Hillcrest Station Area Specific Plan are to:

Land Use and Development

- Establish a signature area of Antioch with high quality development and dynamic pedestrian areas that add to the quality of life of the city.
- Designate sites for new employment uses that add quality jobs and improve the City's job/housing balance. Accommodate at least 5,000 jobs in order to create a sub-regional employment center.
- Create a transit village residential neighborhood, with a variety of high-density housing types within walking and bicycling distance of the transit station.
- Designate sites for retail uses that can take advantage of the freeway visibility and access.

Circulation

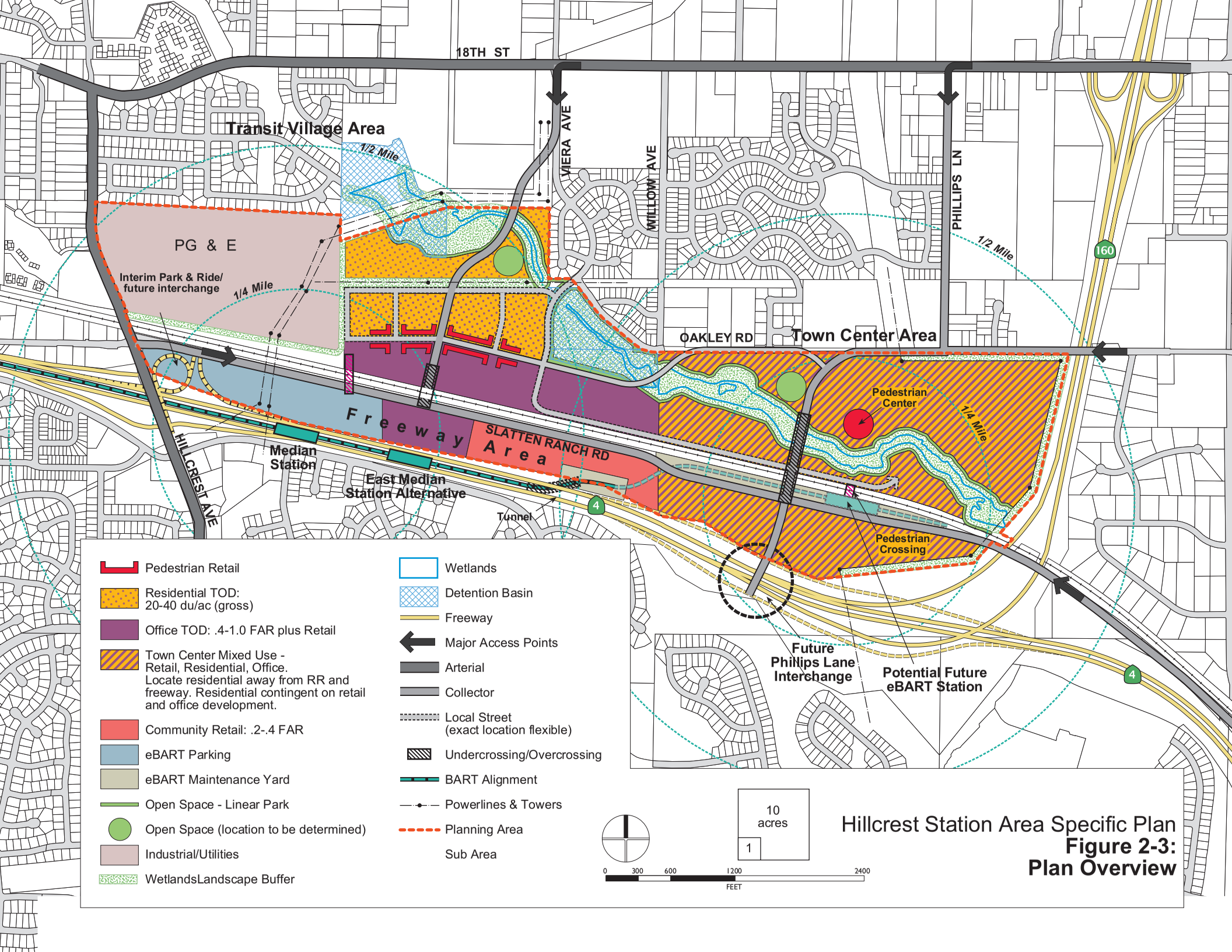
- Generate transit ridership to support the public investment in eBART.
- Construct roads to serve new development.
- Minimize impacts on regional highway facilities and on surrounding residential neighborhoods.
- Enhance multi-modal access and connectivity for pedestrians, bicyclists, automobile drivers, bus, and eBART passengers.

Environmental Protection

- Provide appropriate protection for wildlife habitat, biological resources, and other sensitive natural features of the Hillcrest Station Area.
- Ensure that land uses and circulation routes are compatible with the surrounding neighborhoods.
- Ensure that sensitive receptors such as homes and schools are adequately protected from noise and air emissions.

Infrastructure and Financing

- Establish infrastructure for roads, water, sewer, storm drainage, utilities, and other systems needed to support development.
- Establish parks, trails, and other community facilities necessary to serve future development.
- Establish financing mechanisms to pay for the infrastructure and services required to support development.
- Ensure that the revenues generated from the area and the expenses to provide services do not adversely affect the fiscal stability of the City.



Hillcrest Station Area Specific Plan

Figure 2-3:
Plan Overview

2.3 PROPOSED PLAN

The proposed Plan is illustrated in Figure 2-3. The Plan Overview incorporates the proposed land use, circulation, and open space frameworks. Overall, the proposed Plan supports a maximum of 2,500 residential units and 2.5 million square feet of commercial development with 5,600 jobs. A number of major infrastructure choices have not yet been determined, and require multi-jurisdictional and agency cooperation in order to be finalized. The two primary outstanding issues are the location of the eBART station(s) and the feasibility of a new interchange for SR 4 near Phillips Lane. These infrastructure components are fundamental to the land use and circulation networks proposed in the Plan.

Implementation of the proposed Plan is likely to occur within sub-areas, with the amounts of development in each area based on the construction of specific infrastructure components. The western portion of the Planning Area is a transit village designed around the eBART station. The station is to be located in the Highway SR 4 median approximately 1,275 feet east of Hillcrest Avenue. The eastern portion of the Planning Area is planned as a mixed-use town center around the future Phillips Lane Interchange; it could also include a second eBART station located adjacent to the Union Pacific Railroad right-of-way (UP ROW). The area between SR 4 and the UP ROW in the western portion of the Station Area has a more auto-oriented character, and is referred to as the "Freeway Area."

TRANSIT VILLAGE

Transit villages maximize opportunities for the use of public transit by creating compact neighborhoods where people can live, work, and walk to shops, restaurants, and services. Such villages provide a mix of uses that are mutually supportive, such as housing with neighborhood retail or offices with commercial services. The Hillcrest Transit Village is focused on the eBART Median Station in the SR 4 median, approximately 1,275 feet east of Hillcrest Avenue. An alternative East Median Station location is illustrated 2,175 feet from Hillcrest Avenue. The alternative station location increases the pedestrian accessibility to the Transit Village; however, it increases the cost of the eBART project.

The Transit Village emphasizes office development near the eBART station, to help the City of Antioch meet its need for a greater employment base and to balance the SR 4 traffic flow. Office Transit-Oriented Development (TOD) will create a compact employment center generally between the UP ROW and Oakley Road within walking distance of the station, so that employees have the option to use public transit to commute. At buildout, the Transit Village could support more than 2,300 jobs.

A mixed-use residential area is located north of Oakley Road. This Residential Transit-Oriented Development (TOD) area allows a maximum of 1,000 new housing units, with some ground floor retail, commercial services, and office space. The neighborhood will include a variety of housing types such as live work units, lofts, condominiums, apartment buildings, senior housing, and/or townhouses. Transit Village residents will be able to walk or bicycle to neighborhood services and potentially to work, or have easy access to public transit. Parks and open space will be integrated with the residential development.

A network of new roads with pedestrian and bicycle facilities efficiently connect walkers, bikers, and vehicles to major destinations, such as the eBART station, shopping, public plazas, and open space. The western segment of Oakley Road will be a pedestrian-oriented street at the heart of the transit village, serving both residents and office employees. It will be fronted with buildings that have retail, restaurants, commercial service, and other active uses on the ground floor. Outdoor dining and landscaped public spaces will enhance the pedestrian experience so that workers and residents are able to walk to the services they need on a daily basis. This dynamic public space will create a transition area between the office and residential uses.

TOWN CENTER

A Town Center can generally be described as a high-intensity commercial core including retail, restaurants, entertainment and hospitality uses surrounded by residential and office uses. A second eBART station would potentially be a focal point of this 100-acre mixed-use area. The development of a Town Center in the eastern portion of the Station Area is predicated on a new Phillips Lane freeway interchange, to accommodate both local and regional traffic. When the Phillips Lane Interchange is approved, a Town Center Master Plan will need to be prepared to show how land uses east of Willow Avenue are integrated with a network of streets, parks, and public spaces. Pedestrian connections will be a key feature, providing access to public transit, and East Antioch Creek, and parks. The goal is to create a unique, attractive, and memorable destination for Antioch residents and visitors.

The Hillcrest Town Center can support almost 1.4 million square feet of commercial and hotel uses and a maximum of 1,500 housing units. New higher-intensity uses at the pedestrian core of this area will need to be transitioned to the existing neighborhoods to the north of Oakley Road. This transition can be facilitated by locating similar uses near each other, reducing building heights, designing building step-backs, and providing larger set-backs and/or landscaped buffer areas. Office or other major commercial uses should be located along the highway and railroad to increase visibility and access for new businesses. Residential and other sensitive uses should be limited in this same area in order to reduce the potential for noise and air quality impacts.

A primary asset in the eastern portion of the Station Area is East Antioch Creek. In order to preserve the creek's natural functions while enhancing the area's recreational opportunities, a loop trail system will be installed around the perimeter of the protected wetland areas. A minimum 50-foot buffer will be maintained to preserve wildlife habitat and critical flood management. An adjacent 25-feet wide area will be landscaped and enhanced to create a recreation corridor. A continuous multi-use trail will provide a critical link between the Town Center and the Transit Village.

If the Phillips Lane Interchange is not approved, land use and circulation plans for the eastern portion of the Hillcrest Station Area will have to be reevaluated and revised, and the Specific Plan amended.

FREEWAY AREA

Office TOD and commercial retail uses are located between SR 4 and the railroad tracks in the western portion of the Planning Area, in order to take full advantage of the freeway access and the high-visibility location. The area will also accommodate transit facilities, including eBART and bus facilities, parking, passenger drop-off, and shuttle and taxi areas, plus a small public plaza at the eBART station. The initial phase of parking development will accommodate the estimated eBART demand when the system opens in 2015 of 1,000 spaces. Parking will be located adjacent to the Hillcrest Avenue Interchange, incorporating the existing Park-and-Ride lot. Future parking needs for the eBART station, estimated to be a total of 2,600 spaces, will need to be accommodated primarily in a parking structure within this Freeway Area. It is anticipated that most eBART maintenance activities take place within the freeway median, but there is also a small maintenance yard adjacent to the freeway.

LAND USE CLASSIFICATIONS

Residential TOD

This mixed-use classification is intended to create a primarily residential neighborhood within walking distance to the eBART station, with complimentary retail, service, and office uses. Residential densities are permitted between a minimum of 20 and a maximum of 40 units per gross acre. A range of housing types may be included in a development project, some of which may be as low as 10 units per acre provided the total project meets the minimum density standard. Residential units should be at least 300 feet away from rail and freeway right-of-ways, or incorporate construction measures that mitigate noise and air emission impacts. Retail, restaurants, commercial services, and office are allowed on the ground floor and second floor, particularly on pedestrian retail streets and adjacent to Office TOD designations. Low intensity stand-alone retail or restaurant uses with surface parking are not permitted. Fee parking in surface parking lots is not permitted as a primary use.

Office TOD

This classification is intended to provide a compact office employment center close to the eBART station. The maximum Floor Area Ratio (FAR) allowed is 1.0. A portion of the parking should be in parking decks or structures. Retail, restaurant, and commercial service uses that serve employees are permitted and encouraged on the ground floor. Low density, single-use retail or entertainment developments with surface parking are not permitted. Commercial parking in surface lots requires a conditional use permit (where it is a primary use, not associated with a development project).

Town Center Mixed Use

This classification is intended to provide for an integrated mix of high-intensity uses in the area surrounding the potential second eBART station near Phillips Lane. Residential, commercial, employment, entertainment, and hospitality uses are permitted. Both horizontal mixed-use and vertical mixed-use projects are appropriate in this area. Retail, restaurant, and service uses are to be located on the ground floor in the pedestrian Town Center. Office space or residential space may be on upper floors. Development is to be high-density to support pedestrian and bicycle use,

and shall provide easy pedestrian access to the potential transit station. The maximum floor area ratio (FAR) allowed is 1.0.

Residential densities may range from a minimum of 6 to a maximum of 25 units per gross acre (calculated based on the entire Town Center Mixed Use area.) A range of housing types may be included in a development project, some of which may be as high as 50 units per acre provided the total project does not exceed the maximum density standard. Residential units should be at least 300 feet away from rail and freeway rights-of-way, or should incorporate construction measures that mitigate noise and air emission impacts.

Community Retail

This classification is intended to facilitate the development of a community commercial center with highway frontage. The site shall be at least 10 acres and be developed with a maximum FAR of 0.30. This site may share parking with the adjacent Office TOD or Town Center Mixed Use development.

Public/Institutional – Transportation Facilities

This classification is intended to include the eBART parking, maintenance yard, and other associated transit uses, such as the drop-off areas, taxi or shuttle areas, and bus stops.

Open Space

This classification includes public open space areas that serve the residents and employees of the Hillcrest Station Area. A minimum of five acres of improved public or private open space per 1,000 residents must be provided. Open space areas may include: multi-use trail areas, public and private recreational facilities such as tot lots or picnic areas, public parks, and plazas open to the public. Development sponsors can apply for park credit to meet a portion of the park requirements by providing appropriate, native landscaping in the wetland buffer area, as approved by the City and a certified wetland biologist, and/ by providing trails and passive recreation areas in the utility easement landscape buffers.

Industrial

The PG&E substation parcels are designated as industrial, and are not assumed to redevelop with any other industrial uses.

DEVELOPMENT DENSITY STANDARDS

Development density standards in the Hillcrest Station Area Specific Plan are based on gross land acreages, including land that will be dedicated for streets and parks. Therefore, the net project densities may be higher than those expressed in the standards shown in Table 2-1. Density standards for residential land use classifications are expressed as dwelling units per gross acre (du/ac). For non-residential and vertically mixed-use developments, development density is described as Floor Area Ratio (FAR). FAR is obtained by dividing gross floor area by total lot area. Structured parking areas are not counted as floor area.

Table 2-1 Development Density Standards

Land Use	FAR	Residential Density		Other Density Provisions
	Maximum	Minimum	Maximum	
Residential TOD	N/A	20	40	Up to 100 sf commercial space permitted per residential unit. (includes retail, restaurant, office, and personal services)
Office TOD	1.0	N/A	N/A	Up to 2.5 FAR possible on individual sites.
Town Center Mixed Use	1.0 *	6	25	• Up to 2.5 FAR possible on individual sites. • Up to 50 units per acre possible on individual sites.
Community Retail	0.3	N/A	N/A	

* The maximum FAR is calculated over the entire Town Center Master Plan area and includes the floor area of all uses including residential and hotel.

Source: Dyett & Bhatia, 2008.

2.4 SPECIFIC PLAN BUILDOUT

Full development under the proposed Plan is referred to as "buildout." Although the proposed Plan applies a 26-year planning horizon, to the year 2035, the Plan is not intended to specify or anticipate when buildout will actually occur; nor does the designation of a site for a certain use necessarily mean the site will definitely be developed with that use in the next 26 years. These projections of the total amount of development in the Hillcrest Station Area were prepared to assess the potential intensity of development and its impact on transportation, City budget, and utilities infrastructure. The ultimate amount of development could be less than projected, depending on market conditions and whether sites are built to the maximum limits. If the amount of development exceeds the projections, additional environmental review would be required. This section describes the implications of the Specific Plan buildout in terms of future population, housing units, and jobs.

LAND USE, HOUSING, AND POPULATION

The proposed Specific Plan creates a land use and regulatory framework that allows up to 2,500 residential units and 2.5 million square feet of commercial uses in the Planning Area. Growth projections are based on gross acreage of each land use category, as seen in Table 2-2.

Table 2-2 Hillcrest Station Area Land Use Summary

Land Use	*Gross Acres*	*Percent of Total*
Community Retail	13.0	3%
Office TOD	36.6	10%
Residential TOD	38.2	10%
Town Center Mixed Use	105.5	28%
Parks/Open Space [1]	8.6	2%
Public/Institutional – Transit Parking	17.5	5%
Public/Institutional – BART Yard and Future ROW	9.7	3%
Wetlands, Buffer, and Detention Basins	41.6	11%
Industrial/Utilities - PG&E Substation	61.1	16%
UP ROW	19.5	5%
Other: Arterial Roads and Collectors	23.8	6%
Total	**375.1**	**100%**

1. Except for the creek-side loop trail, the locations of the parks have not been defined. When the master plans are completed, land will be dedicated from the appropriate parcels. The amount of park/open space land is based on the estimated number of residential units and household size.

Source: Dyett & Bhatia, 2008.

It is assumed that development will be built at approximately the midpoint of the permitted density or intensity range, when averaged over the entire development area. Assumptions were also made about the percentage of land uses types within the mixed-use categories; for example 2,100 square feet of commercial space per acre (80 square feet per unit) is assumed within the Residential TOD area. Residential units are assumed to be 1,200 gross square feet each (including lobbies, circulation, etc.) The Town Center Mixed Use area is assumed to have 325 hotel rooms, which are 1,000 square feet each.

Table 2-3 Buildout Assumptions: Building Intensity and Density

Land Use	*Total FAR*	*Residential Density*	*Average SF Office per Acre*	*Average SF Retail per Acre*
Residential TOD	-	26	0	2,100
Office TOD	0.60	0	24,600	1,400
Town Center Mixed Use	0.75	14	2,800	6,900
Community Retail	0.25	0	0	10,800

Source: Dyett & Bhatia, 2008.

The proposed Plan includes a policy that limits buildout to a maximum of 2,500 residential units in the Planning Area. The majority of the housing will be in multi-unit structures, often in mixed-use buildings. Based on the residential densities in the Plan, no single-family homes are assumed. Multi-family households are assumed to have 2.0 persons each. This assumption is based on Antioch 2000 US Census block data showing an average multi-family household size of 2.42 persons per unit; and the average household size around the Concord, Pleasant Hill, and Walnut Creek BART Stations which is 1.57 persons per unit.

Table 2-4: Buildout Projections: Housing Units and Population

	Housing Units	*Population*
Transit Village Area	1,000	2,000
Town Center Area	1,500	3,000
Total	**2,500**	**5,000**

Source: Dyett & Bhatia, 2008.

COMMERCIAL SQUARE FOOTAGE AND EMPLOYMENT PROJECTIONS

The land uses designated in the Land Use Plan are expected to support approximately 2.5 million square feet of commercial uses with 5,600 new jobs at buildout. Up to 1.2 million square feet of office space is estimated in the Planning Area, based on the land use designations and floor area ratios. Most of the office space is designated in the Transit Village area. Up to 1.0 million square feet of retail space is projected at buildout. The majority of the retail space is anticipated to be built in the Town Center area. In addition, up to 325 hotel rooms are allowed in the Town Center.

Table 2-5 Buildout Projections: Commercial Square Footage and Jobs

	Office SF	*Retail SF*	*Hotel Rooms*	*Jobs* [1]
Transit Village Area	730,000	120,000	-	2,300
Town Center Area	300,000	730,000	325	2,500
Freeway Area	170,000	150,000	-	800
Total	**1,200,000**	**1,000,000**	**325**	**5,600**

1. Approximate employment generation rates (values rounded):
- Retail: 1 employee per 500 sf gross floor area
- Office: 1 employee per 350 sf gross floor area
- Hotel: 0.8 employees per room.

Source: Dyett & Bhatia, 2008.

2.5 SPECIFIC PLAN IMPLEMENTATION

The proposed Specific Plan provides specific policy guidance for implementation of its initiatives and establishes a basis for coordinated action by the City, adjacent jurisdictions, Contra Costa County, BART, Tri Delta Transit, and regional and state agencies. The Implementation Program will be updated as often as deemed necessary to ensure that it reflects the City's strategic priorities.

POLICY AND REGULATORY IMPLEMENTATION

The project includes the Hillcrest Station Area Specific Plan, as well as the subsequent actions needed to implement the Plan and make it consistent with existing plans and regulations. The City will adopt an amendment to the Antioch General Plan concurrently with adoption of the proposed Plan. The General Plan amendment will include changes to the Land Use and Circulation Elements. Implementation of the proposed Plan will also include, but is not limited to, such tasks as amending the City of Antioch Zoning Ordinance and Map, updating the City's Capital Improvements Program (CIP), and establishing development impact fees.

PHYSICAL IMPLEMENTATION

Area-wide Infrastructure

A series of area-wide infrastructure improvements will take place to accommodate residential, office, and mixed use development; increase access to the eBART station and surrounding area; make it more accessible to and comfortable for pedestrians; improve provide open space amenities; and minimize obstructions to development. New streets, streetscape improvements, and a new creek-side trail system are particularly important to give identity to the area and make it amenable to walking and bicycles.

The Hillcrest Station Area is generally undeveloped and requires most public infrastructure. The Specific Plan included the following infrastructure improvement projects:

Road Improvements

- Slatten Ranch Road - between Hillcrest Avenue and SR 160
- Viera Avenue - between East 18th Street and Slatten Ranch Road
- Oakley Road - between Phillips Lane and Viera Avenue
- Phillips Lane - between East 18th Street and Slatten Ranch Road or future Phillips Lane Interchange at SR 4
- Other local roads

Parks and Open Space Improvements

- Creek-side trail and wetland buffer landscaping
- Public plazas
- Parks and recreation areas

Other Infrastructure

- Potable water distribution lines
- Sanitary sewer collection lines and sewer main improvements
- Stormwater management lines
- Relocation of the PG&E electrical transmission towers and lines in the eastern portion of the Planning Area

The proposed Specific Plan also contains some assumptions about the future road network, without which the Specific Plan will need to be re-evaluated. The following projects are assumed to be completed prior to buildout but are not considered part of the Specific Plan:

- Hillcrest Interchange improvements
- Phillips Lane Interchange with SR 4

Outstanding Development Issues

A series of development issues must be resolved prior to the approval of master plans, land subdivisions, or development projects. These include:

- Determining the location of the eBART station;
- Determining the type of tunnel BART requires;
- Determining the feasibility of the Phillip Lane Interchange with SR 4;
- Determining the alignment for future eBART service extensions;
- Determining the feasibility of a second eBART station within the Planning Area;
- Addressing eBART's future parking demand;
- Determining precise street alignments;
- Identifying and cleaning soil or groundwater contamination;
- Resolving ultimate capacity and location of drainage and/or detention facilities to meet Contra Costa County Flood Control District's needs; and,
- Providing a railroad grade-separation at Hillcrest.

FINANCING RECOMMENDATIONS

There are a large number of infrastructure projects planned for future years, as described above. These will be costly, but necessary to the successful development of the Planning Area according to the proposed Specific Plan. Different agencies and interested parties will need to co-operate and participate in infrastructure funding in various ways. The following funding mechanisms offer potential funding sources for infrastructure in the Planning Area:

- Land dedication requirements for public facilities or right-of-way pursuant to City policy, Code, or specific provisions of the Plan.
- An area-specific development impact fee along with related credit and reimbursement programs that encourage private investment.
- A land or special tax-secured bond issuance (e.g., Mello-Roos Community Facilities District) and possibly other benefit assessment districts.
- Issuance of property tax increment bonds by the Redevelopment Agency.
- Possible funding from the Eastern Contra Costa County Fee and Finance Authority.
- State, federal, or regional funding sources, including sources for major transportation improvements such as Phillips Lane Interchange.

RESPONSIBLE AGENCIES

Overall responsibility for plan implementation is vested in the City Council, Planning Commission, and Director of Community Development. The proposed Specific Plan includes an implementation program, which lists the actions and responsible parties needed to enact the Plan. These mechanisms will require the involvement of City departments such as: Planning, Economic Development, Public Works, Engineering, Parks and Recreation, Building, Police, Fire, and Finance. Other public agencies will need to be involved in the implementation of key infrastructure components, including the following:

- Assistance from BART with installation of a new eBART station and associated transit-related amenities will also be needed.
- Caltrans and CCTA will play critical roles in the necessary improvements to SR 4 and its interchanges within the Planning Area.
- City of Oakley will need to help coordinate various infrastructure improvements.
- Possible joint funding of infrastructure with other East County Communities that are projected to utilize Hillcrest eBART. Approximately 60 percent of projected riders at Hillcrest eBART are from communities other than Antioch.

The City will take the lead in coordinating the area-wide actions.

3 Environmental Impacts

3.1 INTRODUCTION TO ENVIRONMENTAL ANALYSIS

Sections 3.1 through 3.13 of Chapter 3 of this Draft EIR contain a discussion of the potential environmental effects of implementation of the Hillcrest Station Area Specific Plan, including information related to existing conditions, analyses of the type and magnitude of individual and/or cumulative environmental impacts. CEQA Guidelines require that this Draft EIR include a description of the physical environmental conditions in the vicinity of the project, with special emphasis placed on environmental resources that are rare or unique to the region and that would be affected by the proposed Specific Plan.

3.2 FORMAT OF ENVIRONMENTAL ANALYSIS

The technical sections in Chapter 3 are formatted with the same template. Each topic area includes a description of the environmental setting, regulatory setting, significance criteria, and impacts. Impacts are organized by major topic area.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

According to Section 15125 of the CEQA Guidelines, an EIR must include a description of the existing physical environmental conditions in the vicinity of the project to provide the "baseline condition" against which project-related impacts are compared. Normally, the baseline condition is the physical condition that exists when the Notice of Preparation (NOP) is published. The NOP was prepared and available for public review for a 30-day public comment period commencing on May 22, 2008, and ending on June 22, 2008. The NOP and copies of the comments received during the comment period are provided in Appendix A.

REGULATORY SETTING

This Draft EIR must also discuss the regulatory setting and any inconsistencies that exist between the proposed Specific Plan and applicable general and regional plans or local, State or federal agency regulations. The regulatory settings include only the plans and regulations related to the identified impacts. This EIR does not include a comprehensive list of all the plans and regulations which contain the rules and guidelines for each environmental topic area addressed within the Planning Area. The Regulatory Setting has the following subsections:

- **Definitions (if necessary)**
- **Federal Regulations**
- **State Regulations**
- **Local Regulations**

IMPACT ANALYSIS

The Draft EIR must identify the possible significant environmental impacts of the proposed Specific Plan. Only the issues areas that have been identified as having a potential impact are analyzed. There are no identified mineral resources or agricultural resources in the Hillcrest Station Area, so these issues were not analyzed as potential impacts. The impact analysis section addresses the projected buildout conditions in 2035 as compared to the environmental baseline, unless specified that the analysis is for the cumulative growth condition. The cumulative growth includes the total growth anticipated for the City of Antioch and/or the East Contra Costa County communities. Each Impact Analysis section contains the following subsections:

SIGNIFICANCE CRITERIA

The Draft EIR uses the following terms to describe the level of significance of impacts identified during the course of the environmental analysis:

- **Significant and Unavoidable Impact**: Impact that exceeds the defined threshold(s) of significance and cannot be eliminated or reduced to a less than significant level through the implementation of feasible mitigation measures
- **Less than Significant Impact**: Impact that does not exceed the defined threshold(s) of significance
- **Cumulatively Significant Impact, Project Contribution Less than Considerable**: Impact that exceeds the defined threshold of cumulative based on the projected growth for the region; however, analysis indicates that the project's contribution to the impact is less that considerable

METHODOLOGY & ASSUMPTIONS

This subsection identifies the methodology and major assumptions used to analyze potential environmental impacts.

SUMMARY OF IMPACTS

This subsection summarizes the analysis and finding of significance for each issue area. If the proposed plan will have a beneficial or positive effect relative to the current environmental conditions, it is discussed briefly in the summary of impacts.

IMPACTS AND MITIGATION MEASURES

Each impact includes the numbered impact statement followed the ultimate finding of significance in parentheses. The discussion identifies and assumes compliance with applicable laws and regulations. In many cases, compliance with applicable laws, policies, or regulations would reduce the significance of an impact. If existing laws and regulations are insufficient to reduce the impact to less than significant, the proposed Specific Plan policies which would avoid or reduce the level of significance of that impact are listed. No feasible mitigation measures have been identified to reduce the significant and unavoidable impacts.

3.1 Aesthetics and Visual Resources

This section presents the environmental setting and impact analysis for visual resources and aesthetic character. It evaluates to what extent implementation of the proposed Plan will affect the visual quality of the Planning Area.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Visual Character Overview

The Planning Area is characterized mostly by open space covered with grasses and small trees, with a few isolated residential and industrial sites. The southeastern portion of the Planning Area is dominated by two rolling hills, the taller of which has an elevation of approximately 190 feet above sea level. East Antioch Creek meanders across the Planning Area, though water is not always visible. The Union Pacific Railroad right-of-way (UP ROW) Mococo Line also traverses the Planning Area, roughly parallel and 700 feet north of SR 4. A PG&E Substation, electrical transmission lines and towers are dominant visual features. Photos on the following page show the existing visual resources and aesthetic character of the site.

Rolling hills with single family residential neighborhoods and related open space represent the majority of the land uses south of SR 4 and the Planning Area. SR 4 and hills to the south create a physical and visual barrier. Mount Diablo, to the south and west, is about 3,800 feet in elevation; therefore, it can be seen from public streets within the residential development to the north of the Planning Area. Other views are limited by SR 160 to the east, and Hillcrest Avenue and the electrical substation to the west. Land north of the Planning Area is primarily developed as single family homes and a church. A few parcels along Oakley Road are vacant or are cultivated with orchards or grapes. Two cemeteries provide additional visual open space.

Scenic Resources and View Corridors

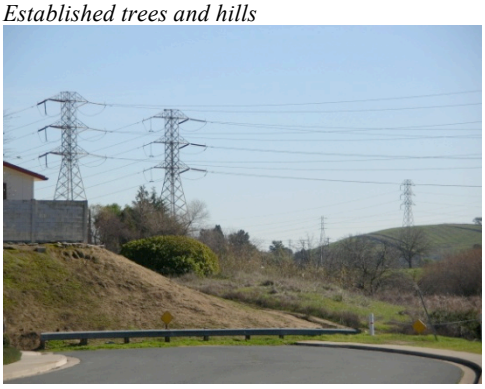
The City of Antioch General Plan identifies views of Mount Diablo, the ridgelines, and the San Joaquin River as important scenic resources for the City because they contribute to community identity, visual enjoyment, and a sense of Antioch's history. Mount Diablo is a prominent regional scenic landmark that can be seen throughout much of the North Bay Area and acts as a visual focal point, particularly for travelers along SR 4. Views of Mount Diablo and other scenic hillsides help reinforce the rural character that historically existed in Antioch, and provides a visual balance to current and planned development. Another prominent natural landmark within the City of Antioch is the San Joaquin River. It is part of the San Francisco Bay/Delta estuary system and extends along the northern part of Antioch, about a mile north of the Planning Area. The San Joaquin River is visible to travelers going north on SR 160 but is not visible from SR 4 or from the Planning Area due to elevation differences, intervening development, and distance to the river.

Hillcrest Avenue Substation and rail line

Non-native grasslands and rolling hills

Established trees and hills

Willow Avenue and car towing yard



Transmission towers and power lines

Wetland marsh and train car storage

Substation and adjacent residential

Seasonal pond

Designated scenic highways and routes are intended to protect and enhance the natural and scenic beauty of the highways, routes and adjacent corridors. Designation ensures that new development projects along recognized scenic corridors are designed to maintain the route's scenic potential. SR 4 (from SR 160 near Antioch to SR 84 near Brentwood) and SR 160 (from SR 4 near Antioch to Sacramento) are both eligible to be State-designated Scenic Highways within the State Scenic Highways program but are not officially designated. (CalTrans, 2008) In the Contra Costa County General Plan, a scenic route is defined as "a road, street, or freeway which traverses a scenic corridor of relatively high visual or cultural value." The County General Plan designates SR 4 (from Hillcrest Avenue to SR 160), Hillcrest Avenue, and East 18th Street as a Connecting Highway and Connecting Roads that form the County Scenic Routes Plan. There are no significant resources within the Planning Area along these portions of highways and roads.

Light and Glare

There are no known sources of light or glare within or near the Planning Area.

REGULATORY SETTING

State Regulations

California Scenic Highways Program

Recognizing the value of scenic areas and the value of views from roads in such areas, the State Legislature established the California Scenic Highway Program in 1963. This legislation sees scenic highways as "a vital part of the all encompassing effort…to protect and enhance California's beauty, amenity and quality of life." Under this program, a number of State highways have been designated as eligible for inclusion as scenic routes. Once the local jurisdictions through which the roadway passes have established a corridor protection program and the Departmental Transportation Advisory Committee recommends designation of the roadway, the State may officially designate roadways as scenic routes. Interstate highways, state highways, and county roads may be designated as scenic under the program. The Master Plan of State Highways Eligible for Official Scenic Highway Designation maps show designated highway segments, as well as those that are eligible for designation. Changes to the map require an act of the legislature.

As noted, a corridor protection program must be adopted by the local governments with land use jurisdiction through which the roadway passes as the first step in moving a road from "eligible" to "designated" status. Each designated corridor is monitored by the State and designation may be revoked if a local government fails to enforce the provisions of the corridor protection program. At a minimum, each corridor protection program must include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising devices;
- Control of earthmoving and landscaping; and
- Regulation of the design and appearance of structures and equipment.

The Master Plan of State Highways Eligible for Official Scenic Highway Designation requires that proposed projects be evaluated for their impact on the scenic qualities of the corridor.

Local Regulations

Contra Costa County General Plan

Scenic Routes Policies

5-35. Scenic corridors shall be maintained with the intent of protecting attractive natural qualities adjacent to various roads throughout the County.

5-37. Scenic views observable from scenic routes shall be conserved, enhanced, and protected to the extent possible.

5-44. Aesthetic design flexibility of development projects within a scenic corridor shall be encouraged.

City of Antioch General Plan

5.4.2 Community Image and Design: General Design Policies

c. Maintain view corridors from public spaces to natural ridgelines and landmarks, such as Mount Diablo and distant hills, local ridgelines, the San Joaquin River, and other water bodies.

- Recognizing that new development will inevitably result in some loss of existing views, as part of the City's review of development and commercial and industrial landscape plans, minimize the loss of views from public spaces.
- Important view corridors to be protected include Somersville Road, Lone Tree Way, Hillcrest Avenue, SR 4, SR 160, James Donlon Boulevard, Deer Valley Road, and Empire Mine Road.

e. Create a framework of public spaces at the neighborhood, community, and regional scale.

- Provide an open space network linked by pedestrian and bicycle paths, which preserves and enhances Antioch's significant visual and natural resources.
- Views along utility corridors should be retained and enhanced through the use of planting materials to frame and focus views and to provide a sense of orientation.

h. Wherever feasible, existing above-ground utility lines should be placed underground.

o. Design onsite lighting to improve the visual identification of adjacent structures.

- Within commercial and industrial development, provide design features such as screened walls, landscaping, setbacks, and lighting restrictions between the boundaries of adjacent residential land use designations to reduce the impacts of light and glare.
- On-site lighting shall create a safe environment, adhering to established crime prevention standards, but shall not result in nuisance levels of light or glare on adjacent properties. Limit sources of lighting to the minimum required to ensure safe circulation and visibility.

p. Lighting should accommodate night use of streets and promote security while complying with the provision of a dark night sky. Streetscape areas that are used by pedestrians at night should be well lit. Within rural and open space areas, limit street lighting to intersections and other locations that are needed to maintain safe access (e.g., sharp curves).

5.4.14 Community Image and Design: Hillside Design Policies

e. Grading of ridgelines is to be avoided wherever feasible, siting structures sufficiently below ridgelines so as to preserve unobstructed views of a natural skyline. In cases where application of this performance standard would prevent construction of any structures on a lot of record, obstruction of views of a natural skyline shall be minimized through construction techniques and design, and landscaping shall be provided to soften the impact of the new structure.

g. Buildings should be located to preserve existing views and to allow new dwellings access to views similar to those enjoyed from existing dwellings.

10.3.2 Resource Management: Open Space Policies

b. Implement the design standards of the Community Image and Design Element so as to maintain views of the San Joaquin River, Mount Diablo and its foothills, Black Diamond Mines Regional Preserve and other scenic features, and protect the natural character of Antioch's hillside areas as set forth in the Community Image and Design Element.

Local Standard

At this time, no viewshed protection ordinance or standard has been adopted.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Specific Plan would have a potentially significant adverse impact on visual resources if the Plan would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

METHODOLOGY AND ASSUMPTIONS

Aesthetics and visual resources can be subjective by nature, and therefore the level of the proposed Specific Plan's visual impact is difficult to quantify. In addition, it is difficult to estimate the impact future development would have on scenic resources, since individual development projects can enhance the aesthetic quality of an area. As such, this analysis was conducted qualitatively, assessing potential growth implications of the Specific Plan, including the potential degradation of the existing visual character of the Planning Area, particularly its scenic resources such as views of Mount Diablo and surrounding hillsides.

SUMMARY OF IMPACTS

The construction of new projects in the Planning Area could result in short-term visual impacts including blockage or disruption of views by construction equipment and scaffolding, the removal

of landscaping, temporary route changes, temporary signage, exposed excavation and slope faces, and construction staging areas. However, considering Plan policies which require landscaping and other design features in the final built condition, these short-term impacts are found to be less than significant.

New development under the proposed Plan could affect scenic views of Mount Diablo and distant hill from a few streets and/or public spaces. However Plan policies require site planning to incorporate view opportunities towards Mount Diablo, and views of the hillsides and ridgelines will continue to be available from numerous points throughout the Hillcrest Station Area. Thus the impact on these scenic views is less than significant.

New development under the Specific Plan will change the Planning Area's existing undeveloped condition by replacing open grassland and hillsides with new transit-oriented development. In the final built condition of the project, extensive landscaping and public spaces will be added, and key natural features will be preserved, and thus the visual impact of new development under the Proposed Plan will be less than significant.

The construction of new buildings and street lighting may create nighttime light pollution or daytime glare in an area that currently has no sources of light or glare. However, compliance with Plan policies would reduce potentially significant long-term light and glare impacts to less than significant levels.

IMPACTS AND MITIGATION MEASURES

3.1-1 ***Construction of new development under the proposed Plan could adversely affect visual resources in the short-term during period of construction by blocking or disrupting views. (Less than Significant)***

The construction of new projects in the Planning Area could result in short-term visual impacts including blockage or disruption of views by construction equipment and scaffolding, the removal of landscaping, temporary route changes, temporary signage, exposed excavation and slope faces, and construction staging areas. Because current site conditions will be changing during periods of construction, and residential and commercial uses are nearby, construction activities are considered a potentially significant visual impact. However, the construction impact will be short-term and last intermittently during actual phased periods of construction at specific locations within the Planning Area. In the final built condition of the project, extensive landscaping and other design features will be installed, which enhance visual character.

Specific Plan Policy that Reduces Impact

Compliance with the Antioch General Plan and implementation of the following proposed Specific Plan policy will reduce the short-term visual impacts of construction in the Hillcrest Station Area:

UD-17 Reduce the visibility of construction yards and staging areas to the maximum extent possible.

- Construction yards and staging areas shall be located as close to construction areas to the extent practicable away from residential and commercial areas, community traffic, pedestrian use, and local views.
- Low contrast fencing and screening shall be used to minimize contrast with surrounding environment.

Mitigation Measures

No mitigation measures required.

3.1-2 ***New development under the proposed Plan could adversely affect scenic views, scenic resources, or the existing visual character of the Planning Area. (Less than Significant)***

New development under the proposed Plan could affect scenic views of Mount Diablo and distant hills, from a few streets and/or public spaces, due to the addition of buildings that are three to eight stories tall. However Plan policies require site planning to incorporate view opportunities towards Mount Diablo, such that views of Mount Diablo are available from both public streets and public open spaces. Moreover, the elevation of Mount Diablo and the distant hillsides is far above the elevation of the Station Area, and thus views of the hillsides and ridgelines will continue to be available from numerous points throughout the Hillcrest Station Area. Thus the impact on these scenic views is less than significant.

New development under the Specific Plan will change the Planning Area's existing undeveloped condition by replacing open grassland and hillsides with new transit-oriented development. The Planning Area will include new structures in the form of residential buildings, office buildings, retail buildings, hotels, and parking structures. Buildings are expected to be between one and eight stories in height. New development will constitute a significant change from existing conditions. The existing General Plan has policies that support the change from open undeveloped area to a mix of transit-oriented development and employment uses.

Many policies are incorporated into the Specific Plan to ensure that the visual character of the Planning Area remains attractive and is not adversely impacted as it is developed with new streets, buildings, and landscaping. East Antioch Creek will be preserved and enhanced, and thus a dominant natural feature of the site is preserved. Extensive landscape buffers will be added throughout the site along existing industrial uses, utility lines, and freeway edges. Parks and public spaces will be created which provide view opportunities to Mount Diablo and distant hills. All new streets incorporate street trees, and streets wider than two lanes often incorporate landscaped medians, as described in Specific Plan Chapter 4: Urban Design. In the final built condition of the project, extensive landscaping and public spaces will be added, and key natural features will be preserved, and thus the visual impact of new development under the Proposed Plan will be less than significant.

Specific Plan Policies that Reduce Impact

Compliance with General Plan policies, Contra Costa County General Plan policies, and proposed Specific Plan policies will reduce the impact on scenic resources to a less than significant level.

Visual Resources

UD-12 Site or design projects to consider their intrusion into important view-sheds towards Mount Diablo and the San Joaquin River.

UD-13 Incorporate view opportunities towards Mount Diablo into site plans, such that views of Mount Diablo are available from both public streets and public open spaces at specified locations.

UD-14 Design buildings to take advantage of views to Mount Diablo, and views of the San Joaquin River from taller buildings.

UD-18 The hillside areas of the site adjacent to SR 4 may be graded to accommodate development. Low-lying areas may be filled to create level development sites.

- All grading and cut and fill activities must be consistent with the environmental protection and hazard policies in Chapter 5.
- Graded slopes and exposed earth surfaces shall be re-vegetated at the earliest opportunity.

UD-19 Design projects to minimize abrupt changes in scale and massing between the project and surrounding natural or man-made forms, such as hillsides, adjacent freeways, and low-lying wetlands. Where appropriate, step buildings up or down to be compatible with the scale of natural features.

UD-26 Locate streets adjacent to parks, pedestrian trails, and detention basins, in order to allow public access to and public views of these recreation and water areas. Avoid locating private rear yards along these public recreation and water areas; this precludes public access and views and can also pose security problems.

Scenic Highway Designation

UD-5 Design the Freeway Area such that businesses can take advantage of the freeway visibility and access, and SR 4 becomes a visually attractive freeway corridor.

- Provide landscape buffers adjacent to the rail line and the highway per the policies regarding landscape buffers.
- Commercial facades facing the freeway and Slatten Ranch Road should both be designed with high-quality materials due to their visibility. Design the freeway-facing building facades with windows, equivalent in design quality to a front façade, in order to present an attractive appearance from the freeway.
- Limit the number of freeway-oriented signs allowed within the Hillcrest Station Area. Work with businesses and property owners to create high-quality, consistent freeway signage for the Hillcrest Station Area. Design any freeway-oriented signs such that SR 4 remains a corridor that is eligible for Scenic Highway designation.

UD-15 Design project site plans and buildings to preserve the potential for Scenic Highway designation for SR 4 and SR 160 adjacent to the Hillcrest Station Area.

UD-16 Work with Contra Costa County and Caltrans to consider the "complete" highway system and minimize impacts on the quality of the views or visual experience, particularly for projects greater than 40 acres in scope.

Mitigation Measures

No mitigation measures are required.

3.1-3 ***New development under the proposed Plan could result in increased light and glare. (Less than Significant)***

Some long-term impacts are associated with the construction of new buildings and street lighting, which may create nighttime light pollution or daytime glare. Nighttime lighting impacts are significant when they interfere with or intrude into sensitive land use areas such as private residences. Nighttime light pollution can also result in diminished views of the nighttime sky, something that can be a noticeable loss in visual quality for communities used to seeing the stars at night. Light pollution is typically related to the use of high voltage light fixtures with inadequate shields and improper positioning or orientation. Glare impacts can cause daytime inference with activities at sensitive land use areas, as defined above, as well as public roadways where automobile drivers can be temporarily blinded by glare thus causing a safety concern.

Compliance with the following General Plan policies (which are also included in the Specific Plan, Chapter 4, Urban Design) would reduce potentially significant long-term light and glare impacts to less than significant levels:

5.4.2 Community Image and Design: General Design Policies

o. Design onsite lighting to improve the visual identification of adjacent structures.

- Within commercial and industrial development, provide design features such as screened walls, landscaping, setbacks, and lighting restrictions between the boundaries of adjacent residential land use designations to reduce the impacts of light and glare.
- On-site lighting shall create a safe environment, adhering to established crime prevention standards, but shall not result in nuisance levels of light or glare on adjacent properties. Limit sources of lighting to the minimum required to ensure safe circulation and visibility.

p. Lighting should accommodate night use of streets and promote security while complying with the provision of a dark night sky. Streetscape areas that are used by pedestrians at night should be well lit. Within rural and open space areas, limit street lighting to intersections and other locations that are needed to maintain safe access (e.g., sharp curves).

Mitigation Measures

No mitigation measures are required.

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3.2 Air Quality

This section considers the local and regional air quality implications of the Hillcrest Station Area Specific Plan. Greenhouse gases (GHG) are addressed in Section 3.5 Climate Change and Energy Use.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Air quality is affected by the rate, amount, and location of pollutant emissions, and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions, including wind speed, wind direction, and air temperature, in combination with local surface topography (i.e., geographic features such as mountains and valleys), determine the effect of air pollutant emissions on local air quality.

Climate and Meteorology

The Planning Area is in northeast Antioch. Antioch has a relatively low natural atmospheric potential for pollution given the persistent and strong winds typical of the area. These winds dilute pollutants and transport them away from the area, so that emissions released in Antioch may influence air quality in the Sacramento and San Joaquin Valleys. Antioch lies on the south side of Carquinez Strait, which is the only sea-level gap in the central and northern California coastal mountains, resulting in relatively strong and persistent winds flowing through the gap.

Prevailing winds are from the west in the Carquinez Straits, particularly during the summer. During summer and fall months, high pressure offshore, coupled with thermal low pressure in the Central Valley, caused by high inland temperatures, sets up a pressure pattern that draws marine air eastward through the Carquinez Straits almost every day. The wind is strongest in the afternoon because that is when the pressure gradient between the East Pacific high and the thermal low is greatest. Afternoon wind speeds of 15 to 20 mph are common throughout the straits region, accelerated by the venturi effect setup by the surrounding hills. Annual average wind speeds are 8.2 mph in Martinez (approximately 20 miles west of the Planning Area), and 9.5 to 10 mph further east.

Sometimes the pressure gradient reverses and flow from the east occurs. In the summer and fall months, this can cause elevated pollutant levels in the Bay Area. Typically for this to occur, high pressure systems centered over the Great Basin or the Pacific Northwest set up an east to west or northeast to southwest pressure gradient. These high pressure periods have low wind speeds and shallow mixing depths, thereby allowing the localized emissions to build up. Furthermore, the air mass from the east is warmer, thereby increasing photochemical activity, and contains more pollutants than the usual cool, clean marine air from the west. During the winter, easterly flow through the Strait is more common. Between storms, with the high pressure system no longer offshore, high pressure over inland areas causes easterly flow into the Bay Area through the Carquinez Strait.

Air temperatures near the Carquinez Strait do not appear to be noticeably affected by its proximity to water nor to the passage of oceanic air flows. Martinez and Antioch average daily maximum

temperatures are mid- to high-50's in the winter and high-80's in the summer, similar to Concord's temperatures. Average minimum temperatures are high-30's to low-40's in winter and mid-50's in summer.

There are many industrial facilities within the Strait region that have significant emissions, i.e. chemical plants and refineries. Although the pollution potential is usually moderated by high wind speeds, there have been infrequent upsets at the facilities that can lead to short term pollution episodes. Furthermore, because the winds in the Straits have a high persistence from the west, receptors to the east of these facilities could have a longer term exposure. (BAAQMD) Local air quality is affected by several major stationary pollutant sources that originate in Antioch and upwind in Pittsburg. Antioch's location downwind of the greater Bay Area also means that pollutants from other areas are transported to the City.

Existing Air Quality and Attainment Status

Criteria Air Pollutants: Bay Area Attainment Status

Ozone, carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter (PM), and lead are the six criteria air pollutants. The major criteria pollutants of concern in the San Francisco Bay Area, such as ozone, carbon monoxide, and particulate matter (both PM-10 and PM-2.5), are monitored at a number of locations. As of January 2007, the Bay Area had nonattainment status for ozone (State and Federal standards) and particulate matter – PM-10 and PM-2.5 (State standards). The Bay Area does attain the state and federal CO standards; however, CO is a concern because it is the predominant pollutant from passenger vehicles. Sulfur dioxide is no longer considered a problem pollutant in California due to improved industrial sources controls, the substitution of natural gas for fuel oil, and lower sulfur content in fuels. The state has attained the sulfur dioxide standard for several years. (BAAQMD, 2008) Table 3.2-1 summarizes the Bay Area Attainment Status.

Criteria Air Pollutants: Local Air Quality

To measure and monitor the ambient concentrations of criteria pollutants in the Bay Area, the BAAQMD operates a regional network of monitoring stations. Pollutant monitoring results for the years 1996 to 2000 in Pittsburg and Concord indicate that air quality in the Contra Costa County area has generally been good. The monitoring station closest to the Planning Area is located at 10th Street in Pittsburg, approximately 3 miles west. The Concord Monitoring Station at 2975 Treat Boulevard is the closest one that monitors Fine Particulate (PM-2.5). Table 3.2-2 shows a five-year summary of monitoring data for ozone, carbon monoxide, PM-10, and PM-2.5, and compares these concentrations with state and national ambient air quality standards. (BAAQMD, 2008) The criteria pollutants listed in bold indicate non-compliance with adopted standards.

Table 3.2-1 Bay Area Attainment Status

Pollutant		*Attainment Status*	
		State Standards[1]	*Federal Standards*[2]
Ozone	8 hour	**Nonattainment** [3]	**Nonattainment** [4]
	1 hour	**Nonattainment**	No Federal Standard [5]
Carbon Monoxide	8 hour	Attainment	Attainment [6]
	1 hour	Attainment	Attainment
Nitrogen Dioxide	1 hour	Attainment	
	Annual Average [7]		Attainment
Sulfur Dioxide	24 hour	Attainment	Attainment
	1 hour	Attainment	
	Annual Average [7]		Attainment
PM-10	Annual Average [7]	**Nonattainment** [8]	
	24 hour	**Nonattainment**	Unclassified
PM-2.5	Annual Average [7]	**Nonattainment** [8]	Attainment
	24 hour		Unclassified [9]
Lead	Quarter		Attainment
	Month Average	Attainment	
Hydrogen Sulfide	1 hour	Unclassified	No Federal Standard
Sulfates	24 hour	Attainment	No Federal Standard
Visibility-Reducing Particles [10]	8 hour	Unclassified	No Federal Standard

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM-10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM-10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.
2. National air quality standards are set by US EPA at levels determined to be protective of public health with an adequate margin of safety. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM-10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m3. The 24-hour PM-2.5 standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m3.
3. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.
4. In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard. US EPA lowered the national 8-hour ozone standard from 0.80 to 0.75 PPM (ie.e. 75 ppb) effective May 27, 2008. EPA will issue final designations based upon the new 0.75 ppm ozone standard by March 2010.
5. The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.
6. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
7. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM-10 is met if the 3-year average falls below the standard at every site. The annual PM-2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.
8. In June 2002, CARB established new annual standards for PM-2.5 and PM-10.
9. U.S EPA lowered the 24-hour PM-2.5 standard from 65 µg/m3 to 35 µg/m3 in 2006. EPA is required to designate the attainment status of BAAQMD for the new standard by December 2009.
10. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Source: BAAQMD, 2008

Ozone

In the Bay Area, on-road motor vehicles are the major sources of ozone precursors, followed by other mobile sources, and petroleum and solvent evaporation. Ozone levels have been trending down in the Bay Area in general, and specifically in Contra Costa County since 1988. Based on implementation of state and district programs and controls, this trend is expected to continue, though at a slower rate. (BAAQMD, 2005) As shown in Table 3.2-2, the downward trend is not consistently reflected at the Pittsburg monitoring station. While there was only one exceedance of the national ozone standards at the monitoring station over the last five years, there were numerous violations of the state ozone standards. Within the Planning Area, there are few sources of ozone since the internal road system is made up of a few dirt roads. However, traffic on Hillcrest Avenue and SR 4 contribute to the local air quality problems.

Carbon Monoxide

The levels of carbon monoxide have been consistently low in the Pittsburg since 2003.

Particulate Matter

Levels of respirable particulate matter have been consistently high in Pittsburg since 2003. The main sources of PM are combustion of fossil fuels, wood burning, airborne dust entrained by motor vehicles and construction, and cooking. PM-2.5 results almost entirely from the combustion of fossil fuels and wood; 35 percent of the Bay Area's annual PM-2.5 emissions are from on-road vehicles, construction equipment, ships, planes, refineries and power plants. The Bay Area has seen significant reductions in PM-10 levels since 1990, with peak concentrations down approximately half and annual average values down by about one-third. BAAQMD estimates that PM-2.5 concentrations have been reduced by similar levels as PM-10. Based on implementation of district programs and controls in the Particulate Matter Implementation Schedule, this trend is expected to continue. Over the last five years, the state PM-10 standard was exceeded nine times at the Pittsburg monitoring station, although concentrations were not above the national standard. In the same five years, only one exceedance of the national PM-2.5 24-hour average standard occurred at the Concord (2975 Treat Boulevard) monitoring station. (BAAQMD, 2005) While there are no significant contributors of particulate matter in the Planning Area currently, off-road vehicle use may contribute to nuisance dust. The Planning Area is affected by pollutant concentrations in Pittsburg and other communities to the west due to prevailing winds from the west.

Table 3.2-2 Local Air Quality Data Summary (2003 – 2007)

Pollutant	*Standard*[2]	*2003*	*2004*	*2005*	*2006*	*2007*
Ozone[1]						
Highest 1-Hour Average (ppm)		0.094	0.090	0.094	**0.105**	0.100
Days over State Standard	0.090	0	0	0	**3**	1
Highest 8-Hour Average (ppm)		**0.080**	**0.081**	**0.078**	**0.093**	**0.074**
Days over State Standard	0.070	**9**	**2**	**2**	**10**	**2**
Days over National Standard	0.080	0	0	0	1	0
Carbon Monoxide						
Highest 8-Hour Average (ppm)		1.66	1.91	1.73	1.92	1.50
Days over State/National Standard	9.00	0	0	0	0	0
Respirable Particulate Matter (PM-10)						
Annual Average (State Standard)	20.0	NA	**21.7**	**20.1**	19.9	19.4
Highest 24-Hour Average (µg/m3)		59.1	64.0	57.0	**58.9**	**59.0**
Days over State Standard [3]	50.0	1	1	1	**2**	**4**
Days over National Standard [3]	150.0	0	0	0	0	0
Fine Particulate Matter (PM-2.5)						
Highest 24-Hour Average (µg/m3)	65/35	49.7	73.7	48.9	62.1	46.2
Days over National Standard 4	35.0	0	1	0	0	0
National Annual Average (µg/m3)	15.0	9.7	NA	9.1	9.3	8.4

11. NA = Not Available; ppm = parts per million; µg/m3 = micrograms per cubic meter.

1. Ozone, carbon monoxide, and PM-10 data is from Pittsburg – 10th Street station. PM-2.5 data is from Concord -2975 Treat Boulevard Station.

2. Generally, State standards and national standards are not to be exceeded more than once per year. Standards listed here are from 2007.

3. PM-10 is not measured every day of the year. It is measured once every 6 days. The data shown refers to the actual number of days measured over the standards.

4. U.S. EPA lowered the 24 hour PM-2.5 standard from 65 µg/m3 to 35 µg/m3. Though the current standard is 35 µg/m3, the estimated days over the national standard refers to days above the 65 ìg/m3 standard.

Source: BAAQMD, 2008.

Toxic Air Contaminants

The California Health and Safety Code defines toxic air contaminants (TACs) as air pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a present or potential hazard to human health. TACs are less pervasive in the urban atmosphere than criteria air pollutants, but are linked to short-term (acute) or long-term (chronic and/or carcinogenic) adverse human health effects. There are many different types of TACs with varying degrees of toxicity. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust – particularly diesel-powered vehicles.

BAAQMD and CARB operate a network of monitoring stations that measure ambient concentrations of certain TACs that are associated with strong health-related effects and are present in appreciable concentrations in the Bay Area. The monitoring station nearest the Planning Area is located on 10th Street in the City of Pittsburg, approximately 3 miles west northwest. Table 3.2-3 summarizes the concentrations of carcinogenic TACs for 2002, highlighting TAC levels that are higher in Pittsburg than in the Bay Area as a whole in bold. The Toxic Air Contaminants 2003 Annual Report did not provide the Bay Area cancer risk for all TACs listed. In the Planning Area, BAAQMD monitors the PG&E substation at 2111 Hillcrest Avenue and the former PG&E metering station near Oakley Road and Phillips Lane for TAC emissions. (BAAQMD, August 2007) In 2003, together these sites emitted 172 pounds of TACs, including benzene (4 percent), xylene (1 percent), toluene (7 percent), MTBE (87 percent), and ethylbenzene (1 percent). Neither site qualifies as a major source of hazardous air pollutants because they do not emit 10 tons or more per year of any individual hazardous air pollutants or 25 tons or more of any combination of hazardous air pollutants. There are currently no facilities in the Bay Area requiring public notification under the BAAQMD Air Toxics Hot Spots Program. (BAAQMD, August 2007)

There is growing evidence that exposure to emissions from diesel-fired engines may result in cancer risks that exceed those attributed to the measured TACs. Diesel particulate matter (DPM) emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk. Most of the DPM risks are from exposure to diesel truck exhaust near freeways. A 2005 report by CARB summarized traffic-related studies which found the additional non-cancer health risk attributable to proximity of a freeway with 100,000 vehicles per day was seen within 1,000 feet and was strongest within 300 feet. California freeway studies show about a 70 percent drop off in particulate pollution levels at 500 feet (CARB, April 2005). Currently, the main sources of DPM in the Planning Area are the freeways, SR 4 and 160, which surround two sides. The Union Pacific Railroad Mococo right-of-way also bisects the Planning Area. At this time, very few diesel trains operate on these tracks.

Table 3.2-3 Ambient Concentrations of Carcinogenic TACs (2003 Annual Mean)

Compound	Concentration (ppb)		Bay Area Cancer Risk (Chances in 1 million)
	Pittsburg	Bay Area	
Acetone	3.77	6.80	
Benzene	0.38	0.401	37.7
1,3-butadiene	0.11	0.12	36.0
Carbon tetrachloride	**0.11**	0.108	29.1
Chloroform	0.02	0.024	0.6
Ethylbenzene	**0.17**	0.135	
Ethylene dibromide	0.01	0.01	
Ethylene dichloride	0.05	0.05	
Methyl chloroform	0.03	0.084	
Methyl ethyl ketone	**0.78**	0.496	
Methylene chloride	**0.49**	0.356	1.3
M/P xylene	**0.71**	0.535	
MTBE	**0.80**	0.532	0.5
O-xylene	**0.24**	0.186	
Perchloroethylene	0.02	0.026	1.1
Toluene	**1.27**	1.062	
Trichloroethylene	**0.03**	0.029	0.2
Trichlorofluoromethane	**0.27**	0.266	
1,1,2-trichlorotrifluoroethane	0.07	0.084	
Vinyl chloride	0.15	0.15	

5. ppb = parts per billion. µg/m3 = micrograms per cubic meter. Units in **bold** show TAC levels greater in Pittsburg than the Bay Area as a whole.

Source: BAAQMD, Toxic Air Contaminants 2003 Annual Report, 2007.

Sensitive Receptors

The location of land uses where sensitive receptors are present, such as day care centers, schools, nursing homes, and hospitals, should be carefully evaluated. State law restricts the siting of new schools within 500 feet of a freeway, urban roadways with 100,000 vehicles/day, or rural roadways with 50,000 vehicles with some exceptions. CARB has published advisory recommendations on siting new sensitive land uses, with the same guidelines as the State school limitation. (California Air Resources Board, April 2005) At this time there are no sensitive receptors in the Planning Area. There are residential neighborhoods and a number of schools within a half mile of the Planning Area.

Odors

Another air quality issue of concern in the Bay Area is nuisance impacts from odors. 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. Odors rarely directly affect health, but they can be very unpleasant and lead to distress and

concern over possible health effects among the public, generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors. At this time there are no known sources of objectionable odors in the Planning Area.

REGULATORY SETTING

Regulation of air pollution is achieved through both national and State ambient air quality standards and emissions limits for individual sources of air pollutants. As required by the Federal Clean Air Act, US EPA has established National Ambient Air Quality Standards (national standards) to protect public health and welfare. California has adopted more stringent ambient air quality standards for most of the criteria air pollutants (referred to as State Ambient Air Quality Standards or State standards). In addition, California has established State ambient air quality standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

Definitions

Attainment Status

Under amendments to the Federal Clean Air Act, EPA has classified air basins or portions thereof, as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act, patterned after the Federal Clean Air Act, also designates areas as "attainment" or "nonattainment" for State standards. Thus, California has two sets of attainment/nonattainment designations: one with respect to national standards and one with respect to State standards

Criteria Air Pollutants

As required by the Federal Clean Air Act passed in 1977, EPA has identified six criteria air pollutants that are pervasive in urban environments and for which State and national health-based ambient air quality standards have been established. The EPA identifies these pollutants as criteria air pollutants because the agency has regulated them by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. Ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter (PM-10 and PM-2.5), and lead are the six criteria air pollutants.

- **Ozone (O3).** Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone. Ground level ozone in conjunction with suspended particulate matter in the atmosphere leads to hazy conditions generally termed as "smog."

- **Carbon Monoxide (CO).** Carbon monoxide, a colorless and odorless gas, is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High carbon monoxide concentrations develop primarily during winter when periods of light wind combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased carbon monoxide emission rates at low air temperatures. When inhaled at high concentrations, carbon monoxide 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.
- **Nitrogen Dioxide (NO2).** Nitrogen dioxide is an air quality concern because it acts a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is produced by fuel combustion in motor vehicles, industrial stationary sources, ships, aircraft, and rail transit.
- **Sulfur Dioxide (SO2).** Sulfur dioxide is a combustion product of sulfur or sulfur-containing fuels such as coal and oil, which are restricted in the San Joaquin Valley. Its health effects include breathing problems and may cause permanent damage to lungs. SO2 is an ingredient in acid rain, which can damage trees, lakes and property, and can also reduce visibility.
- **Particulate Matter.** PM-10 and PM-2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. (A micron is one-millionth of a meter). PM-10 and PM-2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles (PM-2.5) of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.
- **Lead.** Leaded gasoline (which is being phased out), paint (houses, cars), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neuron-toxic health effects for which children are at special risk. Some lead-containing chemicals cause cancer in animals.

Hazardous Air Pollutants

The federal Clean Air Act defines hazardous air pollutants as those which may reasonably be anticipated to result in increased deaths or serious illness and which are not already regulated.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Land uses such as schools, children's day care centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress and other air quality-related health problems. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas

are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions.

Toxic Air Contaminants

The Health and Safety Code defines toxic air contaminants (TACs) as air pollutants that may cause or contribute to an increase in mortality or in serious illness, or that may pose a present or potential hazard to human health. TACs are less pervasive in the urban atmosphere than criteria air pollutants, but are linked to short-term (acute) or long-term (chronic and/or carcinogenic) adverse human health effects. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust. The current list of toxic air contaminants includes approximately 200 compounds, including all of the toxics identified under federal law plus additional compounds, such as particulate emissions from diesel-fueled engines, which were added in 1998.

- **Diesel particulate matter (DPM)**. Diesel PM has been identified by The California Air Resources Board (CARB) as a toxic air contaminant and represents 70 percent of the known potential cancer risk from air toxics in California. Diesel PM is an important contributor to particulate matter air pollution. Particulate matter exposure is associated with premature mortality and health effects such as asthma exacerbation and hospitalization due to aggravating heart and lung disease.
- **Asbestos.** In 1986, CARB identified asbestos as a toxic air contaminant (TAC) based on its classification as a known cancer causing pollutant. In that process, CARB found that no threshold exposure level could be identified below which adverse health effects would not be expected. Asbestos occurs naturally in ultramafic rock (which includes serpentine). When this material is used in unpaved surfacing and disturbed by vehicles and other means, dust containing asbestos can be generated. Serpentine soils have been identified in Contra Costa County, but not within the Planning Area.

Vehicle Miles Traveled (VMT)

Vehicle miles traveled (VMT) is a term used throughout this EIR and refers to the number of vehicle miles traveled within a specified geographic area during a given period of time. One vehicle traveling one mile constitutes one vehicle mile, regardless of its size or the number of passengers. VMT is a common measure of roadway use and economic activity. The VMT per capita is the total VMT divided by the population of the geographic area; basically, it is a measure of the vehicle miles each person travels on average. Per capita VMT data correlate with various economic and lifestyle factors such as increased auto ownership, more women in the workforce, more teen driving, and land use patterns.

Federal Regulations

The U.S. Environmental Protection Agency (EPA) is responsible for implementing the programs established under the Federal Clean Air Act. The Clean Air Act establishes the framework for federal air pollution control, including direction for the EPA to develop national emission standards for hazardous air. Table 3.2-4 provides the 2008 Ambient Air Quality Standards for the State of California and federal standards. This table also summarizes the related health effects and principal sources of each pollutant. If an area does not meet the federal standard for a pollutant,

the state is required to prepare and adopt State Implementation Plans (SIPs) to show how the standards will be attained.

The federal Clean Air Act also outlines requirements for ensuring that federal transportation plans, programs, and projects conform to the SIP's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards. As such, Regional Transportation Plans (RTPs) and Transportation Improvement Programs (TIPs) that require federal funding or approval must be included in the SIP emissions budget.

National Emission Standards for Hazardous Air Pollutants developed by US EPA in accordance with Title III of the 1990 federal Clean Air Act Amendments regulate "major source" facilities that emit large quantities of toxic air contaminants. These rules require that emissions be reduced using the Maximum Achievable Control Technology (MACT).

State Regulations

In California, the California Air Resources Board (CARB) is responsible for establishing and reviewing California ambient air quality standards, developing and managing the California SIP, securing approval of this plan from US EPA, and identifying TACs. The California Clean Air Act of 1988 focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards. Local and regional air districts are required to prepare and adopt air quality attainment plans if the district violates the state standards.

The State of California's regulatory efforts regarding the identification and control of toxic air contaminants are embodied in AB 1807, the Tanner Bill (effective 1984). The California Air Resources Board (ARB) identifies the most important toxic pollutants by considering risk of harm to public health, amount or potential amount of emissions, manner of usage of the substance, its persistence in the atmosphere, and its concentration in the outdoor air. CARB also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. All new diesel-powered engines and vehicles sold in California are required to meet both federal and state emissions certification requirements. The Air Toxics 'Hot Spots" Act (AB 2588) was enacted in 1987 with the objective of collecting information concerning industrial emissions of toxic air contaminants and making the information available to the public.

Table 3.2-4 State and National Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	*Averaging Time*	*California Standard*	*National Primary Standard*	*Major Pollutant Sources*	*Pollutant Health and Atmospheric Effects*
Ozone	1 hour	0.09 ppm	---	On-road motor vehicles, other mobile sources, solvent extraction, combustion, industrial and commercial processes.	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.
	8 hour	0.07 ppm	0.08 ppm		
Carbon Monoxide	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.
	8 hour	9.0 ppm	9.0 ppm		
Nitrogen Dioxide	1 hour	0.18 ppm	---	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.	Irritating to eyes and respiratory tract. Colors atmosphere reddish brown.
	Annual Average	0.03 ppm	0.053 ppm		
Sulfur Dioxide	1 hour	0.25 ppm	---	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.	Irritates upper respiratory tract, injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron and steel. Limits visibility and reduces sunlight.
	24 hour	0.04 ppm	0.14 ppm		
	Annual Average	---	0.03 ppm		
Respirable Particulate Matter (PM-10)	24 hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).	May irritate eyes and respiratory tract, decreases lung capacity and increases risk of cancer and mortality. Produces haze and limit visibility.
	Annual Average	20 $\mu g/m^3$	---		
Fine Particulate Matter (PM-2.5)	24 hour	---	35 $\mu g/m^3$	Fuel combustion in motor vehicles, equipment and industrial sources; residential and agricultural burning. Also formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	Increases respiratory disease, lung damage, cancer and premature death. Reduces visibility and results in surface soiling.
	Annual Average	12 $\mu g/m^3$	15 $\mu g/m^3$		
Lead	Monthly Average	1.5 $\mu g/m^3$	---	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction.
	Quarterly	---	1.5 $\mu g/m^3$		

6. Note: ppm=parts per million; and $\mu g/m3$=micrograms per cubic meter

Source: California Air Resource Board, available at www.arb.ca.gov/research/aaqs/aaqs2.pdf, Published April 2008. Accessed June 2, 2008.

Regional Regulations

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with regulatory authority over emission sources in the Bay Area, which includes all of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Marin, and Napa counties, and the southern half of Sonoma and southwestern half of Solano counties. An air quality management district is primarily responsible for regulating stationary emissions sources at facilities within its geographic areas and for preparing the air quality plans required under the Federal Clean Air Act and California Clean Air Act. BAAQMD also maintains the regional Toxics Emission Inventory.

Ozone

BAAQMD has prepared both federal and state air quality plans to bring the San Francisco Bay Area Air Basin (SFBAAB) into attainment with ozone standards. The 2001 Ozone Attainment Plan describes the Bay Area's strategy for compliance with the federal 1-hour ozone standard. Although the US EPA revoked the federal 1-hour ozone standard on June 15, 2005, the emission reduction commitments in the plan are still being carried out by the BAAQMD. The Bay Area 2005 Ozone Strategy is the current adopted plan describing the strategy for compliance with the state 1-hour ozone standard. This plan is the most current triennial update to the 1991 Clean Air Plan.

Carbon Monoxide

The 1996 Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas was developed by the air districts with jurisdiction over ten planning areas (including the BAAQMD) to ensure continued attainment of the Federal carbon monoxide standard. In June 1998, the EPA approved this plan and designated the ten areas as attainment. The maintenance plan was revised most recently in 2004.

Particulate Matter

There is no plan for respirable particulate matter (PM-10) in place, even though the Bay Area does not attain the state standard. However there is a schedule for bringing the Bay Area into compliance, the Particulate Matter Implementation Schedule of 2005. In 2003, SB 656 mandated compliance with state PM standards in order to reduce public exposure to the health risks related to PM.

Toxic Air Contaminants

TACs do not have ambient standards below which no adverse health effects are assumed. Since 1987, BAAQMD has had a program to describe, control, and where possible, eliminate public exposure to airborne toxic compounds from stationary sources. The program elements include preconstruction review processes for new and modified TAC sources; the Air Toxics Hot Spots Program which identifies and monitors industrial and commercial facilities that emit TACs; implementation of control measures to reduce emissions from source categories of TACs; maintenance of the toxic air contaminant air emissions inventory; ambient TAC concentration monitoring; and the Community Air Risk Evaluation (CARE) Program which determines the impacts of TACs at a community level.

BAAQMD has established specific public notification measures for various levels of health risks associated with a facility's routine TAC emissions as determined in a Health Risk Assessment.

The "individual cancer risk" is the likelihood that a person exposed to concentrations of TACs from a facility over a 70-year lifetime will contract cancer, based on the use of standard risk assessment methodology established by the Air Toxics Hot Spots Program.

- Level 1 Risks: Between 10 and 100 in one million
- Level 2 Risks: Between 100 and 500 in one million
- Level 3 Risks: Greater than 500 in one million

BAAQMD Regulation 2, Rule 5 New Source Review of Toxic Air Contaminants implements state guidelines and control requirements for new and modified stationary sources. If the emissions from a stationary source exceed trigger levels, the source must use Best Available Control Technology (BACT) to minimize TAC emissions.

In addition, demolition of buildings constructed prior to 1980 often involved the use of hazardous materials such as asbestos in insulation, fire retardants, or building materials (floor tile, roofing, etc.) and lead-based paint. Airborne asbestos fibers and lead dust pose a serious health threat. The demolition, renovation and removal of asbestos-containing building materials would be subject to the requirements of BAAQMD Regulation 11, Rule 2.

Odors

All odor sources are subject to the requirements of the BAAQMD Regulation 7 – Odorous Substances, which establishes general limitations on odorous substances and specific emission limitations on certain odorous compounds, in addition to the requirements of local nuisance ordinances.

Local Regulations: Antioch General Plan

The City of Antioch 2003 General Plan includes the following policies related to improving local and regional air quality:

10.6.2 Resource Management: Air Quality Policies

a. Require development projects to minimize the generation of particulate emissions during construction through implementation of the dust abatement actions outlined in the CEQA Handbook of the Bay Area Air Quality Management District.

b. Require developers of large residential and non-residential projects to participate in programs and to take measures to improve traffic flow and/or reduce vehicle trips resulting in decreased vehicular emissions. Examples of such efforts may include, but are not limited to the following.

   - Development of mixed use projects, facilitating pedestrian and bicycle transportation and permitting consolidation of vehicular trips.
   - Installation of transit improvements and amenities, including dedicated bus turnouts and sufficient rights-of-way for transit movement, bus shelters, and pedestrian easy access to transit.

- Provision of bicycle and pedestrian facilities, including bicycle lanes and pedestrian walkways connecting residential areas with neighborhood commercial centers, recreational facilities, schools, and other public areas.
- Contributions for off-site mitigation for transit use.
- Provision of charging stations for electric vehicles within large employment-generating and retail developments.

c. Budget for purchase of clean fuel vehicles, including electrical and hybrid vehicles where appropriate, and, if feasible, purchasing natural gas vehicles as diesel powered vehicles are replaced.

d. Support and facilitate employer-based trip reduction programs by recognizing such programs in environmental mitigation measures for traffic and air quality impacts where their ongoing implementation can be ensured and their effectiveness can be monitored.

e. As part of the development review process for non-residential development, require the incorporation of best available technologies to mitigate air quality impacts.

f. Provide physical separations between (1) proposed new industries having the potential for emitting toxic air contaminants and (2) existing and proposed sensitive receptors (e.g., residential areas, schools, and hospitals).

g. Require new wood burning stoves and fireplaces to comply with EPA and BAAQMD approved standards.

3.4.5 Growth Management: Transportation Systems Management Policies

a. Continue to implement the City's TSM program to reduce trip generation and maximize the carrying capacity of the area's roadway system.

b. Work to establish rail transit service within Antioch.

c. Work with Tri-Delta Transit and other service providers to promote regional transit service. Refer proposed development projects to Tri-Delta Transit, and require the provision of bus turnouts and bus stops in locations requested by the agency, where appropriate.

d. Maintain a comprehensive system of bicycle lanes and routes as specified in the Circulation Element.

e. Synchronize traffic signals where feasible to improve the flow of through traffic.

3.6.2 Growth Management: Rate of Growth Policies

a. Limit the issuance of development allocations to a maximum annual average of 600, recognizing that the actual rate of growth will vary from year to year. Thus, unused development allocations may be reallocated in subsequent years, and development allocations may be moved forward from future years, provided that the annual average of 600 development allocations may not be exceeded during any given five-year period (i.e., no more than 3,000 development allocations may be issued for any given five-year period).

4.4.2 Land Use: Residential Land Uses

d. Design new residential development with identifiable neighborhood units, with neighborhood shopping facilities, parks and recreational facilities, and schools provided as an integral component of neighborhood design.

- *Streets*. Street design should route through traffic around, rather than through new neighborhoods. Neighborhood streets should be quiet, safe, and amenable to bicycle and pedestrian use. Within new subdivisions, single-family residences should be fronted on short local streets, which should, in turn, feed onto local collectors, and then onto master planned roadways.
- *Schools, Parks, and Recreation Areas.* Elementary schools, as well as parks and recreational areas should be contained as near the center of the neighborhood they are as is feasible.
- *Neighborhood Commercial Areas*. Neighborhood commercial centers should be located at the periphery of residential neighborhoods, and be designed such that residents can gain vehicular, bicycle, and pedestrian access to the centers directly from the neighborhood.
- *Connections*. Individual neighborhoods should be provided with pathways and open spaces connecting residences to school and recreational facilities, thereby facilitating pedestrian and bicycle access.

4.4.3 Land Use: Commercial Land Uses

a. Design commercial and office developments in such a manner as to complement and not conflict with adjacent residential uses, and provide these developments with safe and easy vehicular, pedestrian, and bicycle access.

b. Orient commercial development toward pedestrian use.

- Commercial buildings should provide a central place of main focus.
- Buildings should be designed and sited so as to present a human-scale environment, including identifiable pedestrian spaces, seating areas and courtyards.
- Uses within pedestrian spaces should contribute to a varied and lively streetscape.
- Buildings facing pedestrian ways and plazas should incorporate design features that provide visual interest at the street level.

c. Building setbacks along major streets should be varied to create plaza-like areas, which attract pedestrians whenever possible.

d. Provide for reciprocal access, where feasible, between commercial and office parcels along commercial corridors to minimize the number of drive entries, reduce traffic along commercial boulevards, and provide an orderly streetscape.

e. Design internal roadways so that direct access is available to all structures visible from a particular parking area entrance in order to eliminate unnecessary vehicle travel, and to improve emergency response.

7.4.2 Circulation: Non-Motorized Transportation

a. Design new residential neighborhoods to provide safe pedestrian and bicycle access to schools, parks and neighborhood commercial facilities.

b. Design intersections for the safe passage of pedestrians and bicycles through the intersection.

c. Provide street lighting that is attractive, functional, and appropriate to the character and scale of the neighborhood or area, and that contributes to vehicular, pedestrian, and bicycle safety.

d. Maintain roadway designs that maintain mobility and accessibility for bicyclists and pedestrians.

e. Integrate multi-use paths into creek corridors, railroad rights-of-way, utility corridors, and park facilities.

f. Provide, as appropriate, bicycle lanes (Class II) or parallel bicycle/pedestrian paths (Class I) along all arterial streets and high volume collector streets, as well as along major access routes to schools and parks.

g. Design new roadway bridges to meet Caltrans standards for bridges involving State highways, including bicycle lanes on all new bridges along Circulation Element roadways. Where provision of bicycle lanes is not feasible, undertake measures to provide alternative routes and to prohibit bicycle riding on bridge walkways.

h. Require the provision of bicycle parking and other support facilities (e.g., racks or lockers) as part of new office and retail developments and public facilities.

i. Where shopping facilities are located adjacent to residential areas, provide direct access between residential and commercial uses without requiring pedestrians and bicyclists to travel completely around the commercial development.

j. Permit the sharing or parallel development of pedestrian walkways with bicycle paths, where this can be safely accomplished, in order to maximize the use of public rights-of-way.

k. Orient site design in non-residential areas to allow for safe and convenient pedestrian access from sidewalks, transit and bus stops, and other pedestrian facilities, in addition to access through required parking facilities.

l. Require the construction of attractive walkways in new residential, commercial, office, and industrial developments, including provision of shading for pedestrian paths.

m. Maximize visibility and access for pedestrians, and encourage the removal of barriers for safe and convenient movement of pedestrians.

n. Ensure that the site design of new developments provides for pedestrian access to existing and future transit routes and transit centers.

o. Pave walks and pedestrian pathways with a hard, all-weather surface that is easy to walk on. Walks and curbs should accommodate pedestrians with disabilities. Walks within open space areas should have specially paved surfaces that blend with the surrounding environment.

p. In general, design walks to provide a direct route for short to medium distance pedestrian trips, and to facilitate the movement of large numbers of pedestrians. Meandering sidewalks are appropriate in areas where the natural topography or low-density land uses lend themselves to informal landscapes.

7.5.2 Circulation: Transit

a. Facilitate development of rail transit centers within the SR 4 Industrial Frontage Focus Area and the East Lone Tree Focus Area by:

   - permitting higher residential densities and mixed-use development adjacent to the rail transit station;
   - working with Caltrans and the Contra Costa County Transportation Commission to provide freeway interchanges capable of serving these transit centers; and
   - working with BART, Amtrak, Tri-Delta Transit, and other transit providers toward the development and implementation of a transit oasis system within areas surrounding area transit centers, including establishment of a system of priority transit lanes or dedicated travel lanes in addition to those needed for vehicular travel to facilitate movement by transit oasis vehicles in areas surrounding the transit center.

b. Permit higher residential densities and mixed-use development adjacent to the downtown Amtrak stop and other rail transit station(s).

c. Approval of higher densities and mixed-use transit-oriented development shall be commensurate with the level of transit service being provided and conditioned upon the availability of adequate public services and facilities pursuant to the performance standards set forth in the Growth Management Element. Approval of such higher densities and mixed-use transit-oriented development shall be approved in anticipation of future transit service only when there is reasonable assurance that transit services will be available within one to two years of initial occupancy of transit-oriented development.

d. Design transit stations to provide safe and convenient vehicular, bicycle, and pedestrian access.

e. Cooperate with Caltrans, Tri-Delta Transit, BART, and other transit providers to establish park-and-ride lots at convenient locations.

f. Pursue cooperation between local and regional transit providers to coordinate multi-modal transit connections (e.g., timed transfers connecting different transit routes and future rail service, bicycle parking at transit centers, and transit stops at park-and-ride lots).

g. Preserve options for future transit use when designing roadway and highway improvements.

h. Include Tri-Delta Transit in the review of new development projects, and require new development to provide transit improvements in proportion to traffic demands created by the project. Transit improvements may include direct and paved access to transit stops, provision of bus turnout areas and bus shelters, and roadway geometric designs to accommodate bus traffic.

i. Encourage ridership on public transit through use of City information sources (e.g., City web site, and mail-outs) to provide information on transit services.

j. Require community care facilities and large age-restricted developments (50 units or more, but excluding facilities designed for “active” adults) to provide transportation services for the convenience of residents.

Antioch Municipal Code

The goals and objectives of the City of Antioch Transportation Systems Management Plan, as adopted in December 1997, are defined in Chapter 15 of the Municipal Code.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

The CEQA Guidelines state that where available significance criteria established by the appropriate regional Air Quality Management District may be used to evaluate the potential air quality impacts of a plan or project. Based on the BAAQMD CEQA Guidelines published in 1999, the proposed Specific Plan would have a significant adverse impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan; or
- Create objectionable odors affecting a substantial number of people.

METHODOLOGY AND ASSUMPTIONS

The methodology recommended by the BAAQMD CEQA Guidelines has been used in evaluating impacts of the proposed Specific Plan. For local plans, the BAAQMD recommends that the analysis focus on evaluating the consistency of the proposed Plan with the adopted Clean Air Plan. In this case, the most recent CAP is the *Bay Area 2005 Ozone Strategy*. The BAAQMD CEQA Guidelines do not require preparing pollutant estimates. The focus is entirely on whether the plan is consistent with regional air quality planning. According to BAAQMD, the proposed Specific Plan should demonstrate that the:

- Population growth for the City of Antioch does not exceed the values included in the *Bay Area 2005 Ozone Strategy*; and,
- Rate of increase in vehicle miles traveled (VMT) for the City of Antioch is equal to or lower than the rate of increase in population; and,
- Proposed Specific Plan is consistent with the Transportation Control Measures included in the *Bay Area 2005 Ozone Strategy.*

For local plans to have a less than significant impact with respect to potential odors and toxic air contaminants, buffer zones should be established around existing and proposed land uses that would emit these air pollutants. Potential air quality impacts on sensitive receptors will need to be evaluated at the project level when individual projects are proposed. (BAAQMD, 1999)

Population estimates in the proposed Specific Plan are based on the average household size by housing type as reported in the 2000 Census Block Groups. Single-household units are assumed to have the same household size as the rest of the City of Antioch, which is 3.18 persons per unit. Population estimates for multi-family units are based on an average of the Antioch multi-family household size (2.42) and the average household size around three Contra Costa BART Stations – Concord, Pleasant Hill, and Walnut Creek (1.57). Multi-family households in the Planning Area are assumed to have 2.0 persons each.

SUMMARY OF IMPACTS

Consistency with Bay Area 2005 Ozone Strategy

The air quality in the Bay Area does not meet state and federal standards. The adopted Clean Air Plan, the *Bay Area 2005 Ozone Strategy*, is the plan that is intended to guide the region towards meeting the standards. Therefore, local plans should be consistent with the adopted CAP. While the regional and local population growth assumptions are likely to be consistent with the assumptions in the CAP, regional and local VMT is still growing faster than population due to employment growth. Therefore, the region's total growth is inconsistent with the adopted CAP, which is considered a significant cumulative impact.

The development projected in the Planning Area will be consistent with regional growth projected because the plan is intended to redistribute City growth rather than induce additional growth. The proposed Specific Plan establishes a framework for transit-oriented development that includes both residential and employment uses. The integration of the land use and circulation plans contribute to a daily VMT per capita that is 7 percent less in the Planning Area than in the City of Antioch in 2035. Finally, the proposed Specific Plan policies incorporate the recommended transportation control measures. Therefore, the project's contribution to the impact is less than considerable.

Toxic Air Contaminants and Odors

Existing and future diesel-fueled mobile sources and stationary sources would generate TACs, particularly diesel particulate matter, which could pose a health risk in the Planning Area and downwind. However, the implementation of the proposed Specific Plan policies which require landscape buffers between sources and new development and limit the location of sensitive receptors near TAC sources reduce this impact to less than significant. There are no know existing or anticipated future sources of objectionable odors to be evaluated.

Construction

Construction activities pursuant to development under the Specific Plan would potentially increase local particulate concentrations primarily due to fugitive dust sources, and increase other criteria pollutant emissions primarily from equipment exhaust. However, the implementation of BAAQMD's required dust-control measures and the Antioch General Plan policies reduce this impact to less than significant, and this impact is not analyzed further.

Sensitive Receptors

This EIR does not evaluate the impact of air quality on sensitive receptors as it is a programmatic review of a plan, and the specific land uses are not yet known. Analysis based on project-specific development will need to be completed when permit applications are submitted for sensitive receptor uses within 300 feet of SR 4, SR 160, or the Union Pacific Railroad tracks. The Specific Plan policies place major limitations on the location of residential uses near rail lines and freeways, and establish requirements for air ventilations systems if necessary to comply with air quality standards. The proposed Specific Plan also requires project sponsors to inform future and/or existing sensitive receptors (such as hospitals, schools, residential uses, and nursing homes) of any potential health impacts resulting from nearby sources of dust, odors, or toxic air contaminants, and where mitigation cannot reduce these impacts.

IMPACTS AND MITIGATION MEASURES

3.2-1 New development under the proposed Specific Plan could be inconsistent with the assumptions in the *Bay Area 2005 Ozone Strategy*. *(Cumulatively Significant, Project Contribution Less than Considerable)*

In order to be consistent with the adopted Clean Air Plan (CAP), the *Bay Area 2055 Ozone Strategy*, the proposed Plan must demonstrate that the cumulative population growth for the City of Antioch with the projected development in the Planning Area does not exceed the values included in the CAP; and that the rate of increase in vehicles miles traveled (VMT) for the City of Antioch does not exceed the population growth rate. In addition, proposed Plans must demonstrate consistency with the Transportation Control Measures included in the *Bay Area 2055 Ozone Strategy.* Plans that cannot demonstrate consistency with these assumptions are considered to have a significant impact on air quality because they may contribute to delaying attainment of state and federal air quality standards.

Cumulative Population

The Association of Bay Area Governments (ABAG) is responsible for making long-term, realistic forecasts of population, households, and employment which are based on historic trends, as well as emerging trends in markets, demographics, and local policies (ABAG, 2007). Regional and local jurisdictions and agencies use ABAG projections to guide planning efforts. The regional population projections in the *Bay Area 2005 Ozone Strategy* are based on ABAG Projections 2002. These projections indicated that the City of Antioch would have approximately 117,500 residents in 2025. The current ABAG 2007 Projections indicate that in 2025 the population could be 119,600, which is 2,100 more residents that assumed in 2002. This alone would suggest that regional growth is inconsistent with the population assumptions in the adopted CAP.

Table 3.2-5 City of Antioch Projected Population Growth

	ABAG 2002		*ABAG 2007*	
Year	*Population*	*Percent Growth*	*Population*	*Percent Growth*
2005	94,000	4%	101,500	12%
2010	101,700	8%	106,000	4%
2015	107,900	6%	110,400	4%
2020	114,600	6%	115,000	4%
2025	117,500	3%	119,600	4%
2030			124,000	4%
2035			128,400	4%
2005-2025 Annual Growth Rate	1.1%		0.82%	

Source: ABAG Projections, 2002 and 2007

However, it is likely that citywide growth will be consistent with the growth projected in the *Bay Area Ozone Strategy 2005*, because there has been a substantial downturn in the economy. The City's historical growth rate indicates that the economic slowdown began to be seen in 2004, as

shown in Table 3.2-6. Antioch has a high foreclosure rate, and thus the market for new units will remain very weak until those foreclosed units are absorbed by the market.

Table 3.2-6 Antioch Historical Growth

Year	*Population*	*Percent Growth*
1990	62,195	
1991	64,157	3.2%
1992	66,914	4.3%
1993	70,185	4.9%
1994	73,291	4.4%
1995	75,805	3.4%
1996	77,925	2.8%
1997	80,662	3.5%
1998	83,550	3.6%
1999	86,408	3.4%
2000	90,532	4.8%
2001	93,222	3.0%
2002	96,770	3.8%
2003	99,244	2.6%
2004	100,892	1.7%
2005	100,714	-0.2%
2006	100,163	-0.5%
2007	99,684	-0.5%
2008	100,361	0.7%

Source: California Department of Finance, 2008.

Based on the 2005-2025 projected annual growth rate of 0.82 percent (ABAG Projections 2007), and the California Department of Finance current population estimate as of the year 2008, the 2025 population would be projected to be 115,383. This calculation is based on the starting population of 100,361 in 2008, and an annual growth rate of 0.82 percent until 2025. The ABAG Projections 2002 estimate of 2025 population contained in the *Bay Area 2005 Ozone Strategy* is 117,500. The revised population estimate of 115, 383 is 2,117 fewer people than the ABAG 2002 projections for 2025. Therefore the population assumptions would be consistent with the assumptions used in the *Bay Area 2005 Ozone Strategy*.

Project Population

The proposed Specific Plan is not considered growth-inducing. Based on case studies from around the country, the implementation of rail transit generally affects the timing, location, and density of how development is accommodated in the station area, but it does not affect the underlying market demand and regional growth projections (City of Seattle Strategic Planning Office, 1999). The proposed Plan will facilitate development in the area only if the residential market improves and the other significant regional accessibility improvements are built. Therefore, the projected

development in the Planning Area is a redistribution of growth, and is not in addition to growth already estimated under regional ABAG projections.

Cumulative VMT

The Contra Costa Transportation Authority (CCTA) Decennial Countywide Travel Demand Model was used to derive citywide VMT characteristics for year 2007 and 2035, including projected development within the Planning Area. In total, the City of Antioch generated 2,583,803 VMT, or 20.5 VMT per capita. For this study, per capita population refers to population plus employment. In 2035, the total VMT is expected to be 4,056,209, indicating an annual growth rate of 1.7 percent. The growth rate in daily VMT is almost double the expected population growth rate. Therefore, the City of Antioch continues to be inconsistent with the assumptions in the *Bay Area 2005 Ozone Strategy*.

Table 3.2-7 Antioch Population and VMT Growth Projections (2007 to 2035)

	2007	*2035*	*Percent Change*	*Annual Growth Rate*
Total Population	100,150	128,400	27%	0.9%
Daily VMT	2,583,803	4,056,209	57%	1.7%
Daily VMT per Capita	20.5	23.6	15%	0.5%

Source: California Department of Finance, 2007; ABAG, 2007; Fehr & Peers, 2008.

The primary reason that VMT is expected to grow faster than population is due to the high rate of employment growth in the City of Antioch. Between 2005 and 2035, ABAG projects that employment will increase from 20,510 to 40,800. This is almost double, and represents an annual growth rate of 2.4 percent. Employees tend to travel more than residents, which leads to higher total VMT.

Project VMT

At buildout, the travel demand model indicates that the VMT per capita within the Planning Area will be 21.9, which is 7 percent less than the citywide VMT per capita. (See Section 3.3: Circulation and Traffic Impacts Analysis.) The proposed Specific Plan supports a new employment center with about 5,600 jobs near eBART and Tri Delta Transit bus service. The large number of employees in the area contributes to a higher daily VMT per capita than if the area was a suburban residential or business park area. Because of the proximity to transit options, employees will have more opportunity to use transit or other alternative modes of travel. In addition, the Planning Area will contain a mix of commercial retail and services which will reduce the number of trips residents and employees need to make by personal vehicle. Trip-chaining, increased opportunities for walking and bicycling, and access to transit will reduce daily VMT for residents. Therefore, the projected development under Hillcrest Station Area Specific Plan's contribution to the cumulatively significant inconsistency with the adopted CAP is not cumulatively considerable.

Transportation Control Measures

The 1988 California Clean Air Act, Section 40919(d) requires regions to implement "transportation control measures to substantially reduce the rate of increase in passenger vehicle trips and miles traveled." Consistent with this requirement, a primary goal of the *Bay Area 2005*

Ozone Strategy is to reduce the number of trips and vehicle miles Bay Area residents travel in single-occupant vehicles through the implementation of nineteen Transportation Control Measures (TCMs). Local governments should implement the following TCMs through local plans to be considered in conformance with the *2005 Ozone Strategy*:

- Support Voluntary Employer-Based Trip Reduction Programs
- Improve Bicycle Access and Facilities
- Improve Arterial Traffic Management
- Implement Local Clean Air Plans, Policies and Programs
- Conduct Demonstration Projects
- Increase Pedestrian Travel
- Promote Traffic Calming Measures (BAAQMD, 2006)

The Antioch General Plan contains several policies, many of which are listed in this section under Local Regulations, that support employer-based trip-reduction programs, improve pedestrian and bicycle access and facilities, improve arterial traffic management, and promote traffic calming measures. Development in the Planning Area would be subject to the policies contained in the General Plan that are consistent with the TCMs in the *2005 Ozone Strategy*.

Transit-oriented development (TOD) as is proposed under the Specific Plan is entirely consistent with the TCM measures in the *Bay Area 2005 Ozone Strategy*. The measures call for compact development around transit stations, which reduces the total vehicle miles traveled compared to existing development patterns typical in Antioch. The proposed Specific Plan policies listed below also incorporate many of the recommended TCMs.

Summary of Consistency with the Bay Area 2005 Ozone Strategy

The air quality in the Bay Area does not meet state and federal standards. The adopted Clean Air Plan, the *Bay Area 2005 Ozone Strategy*, is the plan that is intended to guide the region towards meeting the standards. Therefore, local plans should be consistent with the adopted CAP. While the regional and local population growth assumptions are likely to be consistent with the assumptions in the CAP, regional and local VMT is still growing faster than population due to employment growth. Therefore, the region's total growth is inconsistent with the adopted CAP, which is considered a significant cumulative impact.

The development projected in the Planning Area will be consistent with regional growth projected because the plan is intended to redistribute City growth rather than induce additional growth. The proposed Specific Plan establishes a framework for transit-oriented development that includes both residential and employment uses. The integration of the land use and circulation plans contribute to a daily VMT per capita that is 7 percent less in the Planning Area than in the City of Antioch in 2035. Finally, the proposed Specific Plan policies incorporate the recommended transportation control measures. Therefore, the project's contribution to the impact is less than considerable.

Specific Plan Policies that Reduce the Potential Impact

In addition to General Plan policies listed in the Regulatory Setting above, implementation of the Specific Plan policies listed below would ensure that the project does not contribute significantly to the regional growth that is inconsistent with the *Bay Area 2005 Ozone Strategy*.

Policies that Contribute to Reducing VMT: Connected Streets

C-1 Create a connected street network of arterials and collectors that connects with existing local and regional roadways, and provides circulation throughout the Station Area.

C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish:

- Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and,
- Maximum block lengths of approximately 450 feet, or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block).

C-6 Minimize cul-de-sacs to the maximum extent possible. Where cul-de-sacs are necessary due to barriers such as freeways and detention basins:

- Provide at least one pedestrian and bicycle path at the circular end in order to connect to other streets and trails, to allow emergency vehicle access when warranted and to minimize response times for emergency access; and,
- Consider designing cul-de-sacs with a planted cul-de-sac island to limit the amount of pavement and increase stormwater management opportunities.

C-8 All applications for master plans, subdivisions, and development projects shall indicate how streets are connected to existing local and regional roadways, and how a connected network of streets is created throughout the Hillcrest Station Area.

Policies that Contribute to Reducing VMT: Mixed Uses

LU-3 Create a Transit Village in the western portion of the Hillcrest Station Area north of the Union Pacific Railroad right-of-way, with direct pedestrian, bicycle, bus transit, and automobile connections to the eBART station in the median of SR 4.

LU-8 Develop a Town Center in the eastern portion of the Hillcrest Station Area that incorporates retail, entertainment, hospitality, and residential uses in a "lifestyle center" or other pedestrian-oriented format.

LU-14 Allow compatible retail, restaurant, personal service, and other commercial uses within the Office TOD district. These uses must be on the ground floor and publicly accessible.

LU-16 Up to 100 square feet of compatible retail, restaurant, personal service, office, and other commercial uses per residential unit is allowed within the Residential TOD district. These uses must be on the ground floor or second floor, and must be publicly accessible.

LU-4 Locate high-density residential development within a half-mile walk from the eBART station.

- A range of housing types may be included in a development project, some of which may be as low as 10 units per acre provided the total project meets the minimum density standard.
- Residential units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts.

Policies that Contribute to Reducing VMT: Support Alternative Modes

LU-24 Locate eBART parking so that it is accessible to passengers arriving by car, bus, bicycle, or on foot.

LU-27 Provide public bus facilities near each eBART station.

C-3 Design streets so that they incorporate medians, landscaping, sidewalks, street trees, travel lanes, bike lanes, and on-street parking, such that they:

- Are consistent with the desired pedestrian-oriented character and safety; and,
- Meet the needs of all users including drivers, pedestrians, persons with disabilities, bicyclists, and transit users.

C-36 Develop a multi-modal transit center at the median eBART station that provides access to eBART, buses, taxies, and shuttles. Design the transit facilities to include:

- Bus transit center and approximately 8-12 bus bays (moved from the Hillcrest Park-and-Ride lot to the eBART Station parking area);
- Kiss-and-ride limited term parking area;
- Disabled parking;
- Shuttle pick up and drop off area; and,
- Safe and attractive pedestrian and bike crossings to the station.

C-38 Design arterials and arterial intersections, particularly near pedestrian-oriented streets, to accommodate transit services, including bus stops, pull-outs, and shelters.

C-39 Prioritize pedestrian and bicyclist safety at intersections and street crossings with measures such as:

- Contrasting and/or textured paving crosswalks;
- In-ground, blinking crosswalk lights; and,
- Pedestrian refuges and bulb-outs.

C-41 Require development projects to provide walking and biking routes directly to major destinations such as parks, pedestrian centers, and eBART stations.

C-42 Adopt minimum bicycle parking requirements for residential and commercial projects. Bicycle parking should be designed with the following criteria:

- Short-term parking should be visible from the main entrance of buildings.
- Long-term parking should be provided in secure, well-lighted areas.

C-46 Sidewalks should have at least a five-foot wide clear path of travel.

C-47 Provide bike routes throughout the Station Area, as illustrated in Figure 3-5.

- Class 1: Continuous multi-purpose trail along East Antioch Creek and the detention basins
- Class 2: Slatten Ranch Road, Phillips Lane, and Viera Avenue

C-48 Allow bicycle circulation on all local streets, to the extent feasible.

C-49 Design and implement a multi-use trail loop around the wetlands and East Antioch Creek. This loop should include at least two pedestrian crossings across the creek.

C-50 Provide multi-use trails that connect from East Antioch Creek to existing neighborhood parks north of the Station Area.

Transportation Demand Management

C-22 Apply a Transportation Demand Management (TDM) program that reduces single-occupant vehicle trips to development exceeding 25,000 square feet of non-residential space. Components of TDM programs could include:

- Contributions to urban design projects, such as:
  - Bicycle parking, both short- and long-term, located in appropriate places; and,
  - Direct routes to transit (station, shuttle, or bus) and other key destinations that are well-lit and designed for pedestrian comfort.
- Employer-based programs, such as:
  - Carpool and vanpool ride-matching services;
  - Designated employer TDM contact;
  - Guaranteed ride home for transit users and car/vanpoolers;
  - Transit subsidies for employees;
  - Flexible work schedules, shortened work weeks, or options to telecommute;
  - Information campaigns using brochures, boards/kiosks, or other communication outlets; and,
  - Employer provided showers and lockers.
- Meeting or exceeding project design standards, such as:
  - Free and preferential parking for carpools, vanpools, low-emission vehicles, and car-share vehicles;
  - Passenger loading zones; and,
  - Bicycle- and pedestrian- friendly site planning and building design.

Mitigation Measures

No mitigation measures are required.

3.2-2 Implementation of the proposed Specific Plan would expose residents and employees to toxic air contaminants and odors. *(Less than Significant)*

New development will occur near existing and new sources of toxic air contaminants (TACs) under the proposed Specific Plan. The anticipated TAC sources include SR 4 and SR 160, Union Pacific freight trains, eBART DMU vehicles, the PG&E substation, and the former PG&E metering station that has soil contamination.

Diesel Particulate Matter

In 2035, local highways, SR 4 and SR 160, are anticipated to carry more than three times the number of cars and trucks they carried in 2006. The estimated number of trucks will increase from approximately 970 to 3,065, if the truck percentage of the traffic volume remains constant at 5 percent. In the worst case scenario, the total traffic volume on SR 4 will be 90,000 cars per day, according the travel demand model prepare for this EIR. As such, this highway is not classified as a high traffic freeway subject to CARB recommendations on siting new sensitive land uses.

Table 3.2-8 Freeway Traffic Volumes

	Eastbound AM Peak Hour		*Westbound AM Peak Hour*		*Eastbound PM Peak Hour*		*Westbound PM Peak Hour*	
Freeway Segment	*Existing*	*2035*	*Existing*	*2035*	*Existing*	*2035*	*Existing*	*2035*
SR 4, West of Hillcrest Avenue	2040	3,770	2,390	6,450	3,720	7,370	2,880	5,560
SR 4, East of Hillcrest Avenue	1050	3,780	1,340	5,290	2,140	5,410	1,670	5,070
SR 4 (Bypass), West of Laurel Rd		2,120		4,960		5,140		2,830
SR 160, North of East 18th St	416	510	392	1,180	552	1,230	745	620

Source: Fehr & Peers, 2008

Currently, very few freight trains run on the Union Pacific Mococo Railroad right-of-way. However, Union Pacific has announced plans to increase the number of trains on the Mococo Line running through the Planning Area from as many as 10-15 trains per day initially and as many as 25-40 trains per day in the long term. As part of the worst case scenario, this EIR assumes that there will be 40 trains per 24-hour period in 2035. This will be a new source of TACs in the Planning Area.

BART prepared a risk assessment of the proposed DMU technology and alignment to evaluate cancer probability from exposure to diesel-powered vehicles in the project corridor. The results indicate that increased exposure due to the DMU vehicles is below the threshold limits and not a significant contributor of diesel particulate matter to individuals living near the project corridor. The maximum modeled cancer risk from exposure to DMU particulate matter emissions is 3 in one million at the maximally exposed individual (MEI). The cancer risk at the MEI is below the significance threshold of 10 in one million. This modeled impact is based on 27,840 DMU trips

per year, two DMU engines per trip for the year 2015, and three DMU engines per trip for the year 2030. The MEI is the location of highest modeled impact at a residence and assumes an individual would be present at this location for 70 years. The location of the MEI is at a residence along Belle Drive in the City of Pittsburg.

In addition, it was found that the maintenance facilities, used for routine vehicle fueling, washing, and mechanical maintenance, would not generate a substantial amount of pollutant emissions. Diesel back-up generators would not be present at the maintenance facilities associated with the BART's proposed project. (San Francisco Bay Area Rapid Transit District, 2008)

In order to reduce the impact of diesel particulate matter on residents in the Planning Area, the proposed Specific Plan limits the development of residential units within 300 feet of the highways and railroad right-of-way. The urban design policies require that a minimum 25-foot landscaped buffer be provided next to highways and the railroad.

Stationary Sources

The existing PG&E substation and former metering station located near the intersection of Phillips Lane and Oakley Road are currently monitored for TAC emissions. The urban design policies of the proposed Specific Plan require a minimum 25-foot landscaped buffer to be provided around the PG&E substation. The former metering station is to be evaluated for human health risks prior to the siting of any sensitive receptors near the parcel.

Any new stationary sources that are constructed as part of development, such as dry cleaners and gas stations, are required by the General Plan to incorporate best available technologies (BACT) to mitigate air quality impacts. In addition all new sources must meet the performance standards defined in BAAQMD Regulation 10. Residential wood burning is also a potential source of TACs in the Planning Area. However, General Plan Policy 10.6.2.g requires that all new wood burning stoves and fireplaces comply with EPA and BAAQMD approved standards. Specific Plan policies also require that project sponsors inform sensitive receptors about any potential health impacts resulting from nearby sources of dust, odors, or toxic air contaminants.

Specific Plan Policy that Reduces the Impact

In addition to the General Plan policies, implementation of the Specific Plan policies listed below would reduce the impact of toxic air contaminants and odors on residents and employees in the Planning Area:

Sensitive Receptors

EH-1 Require air quality analysis based on project-specific development when permit applications are submitted for sensitive receptor uses (such as hospitals, schools, residential uses, and nursing homes) within 300 feet of SR 4, SR 160, the Union Pacific Railroad tracks, or stationary toxic air contaminant sources. If the results show that the carcinogenic human health risk exceeds the BAAQMD standards for toxic air contaminants, the City shall require upgraded ventilation systems with high efficiency filters or equivalent mechanisms to minimize health risks for future residents.

EH-2 Require project sponsors to inform future and/or existing sensitive receptors of any potential health impacts resulting from nearby sources of dust, odors, or toxic air contaminants, and where mitigation cannot reduce these impacts.

LU-23 Locate residential units away from railroads and freeways, to minimize impacts from noise and air emissions. Units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts.

Mobile Sources

UD-20 Provide a continuous landscape buffer along both sides of the rail line corridor, outside of the Union Pacific and Chevron easements. The minimum width of the landscaped buffer shall be 25 feet if adjacent to a building; and 15 feet if adjacent to a street.

- Include landscaping, berming (typically 4 to 5 feet high), and at least one continuous row of trees throughout the area.
- This landscape buffer may be located within the Chevron easement if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project.

UD-21 Provide a continuous landscape buffer, with a minimum width of approximately 25 feet, immediately adjacent to both SR 4 and SR 160.

- Design landscaping along highway corridors to add significant natural elements and visual interest to soften the hard edged, linear travel experience that would otherwise occur.
- Include landscaping and a double row of trees.
- This landscape buffer may be located within the Caltrans right-of-way if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project.

Stationary Sources

UD-22 Provide a continuous landscape buffer, with a minimum width of approximately 25 feet, around the southern and eastern edges of the Hillcrest PG&E Substation.

- Include landscaping and a continuous double row of trees to screen the facility from new development, SR 4, and the eBART station.
- Work with PG&E when the company decides to expand substation operations within their site, to ensure an adequate separation is retained between the substation and development.

EH-39 As part of the project entitlement process, appropriate studies shall be conducted for each site with an open remediation case based on proposed land uses by a qualified environmental professional. The studies shall compare maximum soil, soil gas, and groundwater concentrations to relevant environmental screening levels (ESLs) and evaluate all potential exposure pathways from contaminated groundwater and soil. As required by the appropriate responsible agency, studies shall be prepared for the:

- Former Hickson-Kerley (FKP) Property (APN: 052-051-034);
- Chevron Old Valley Pipeline;
- TAOC New Love Pump Station Site (APN: 052-051-034); and,
- PG&E Oakley Metering Station (APN: 052-051-035)

Mitigation Measures

No mitigation measures are required.

3.2-3 Construction and demolition activities under the proposed Specific Plan could generate fugitive dust and other criteria pollutant emissions which could result health and nuisance impacts in the immediate vicinity of construction sites. ***(Less than Significant)***

Construction activities would occur intermittently at different sites in the Planning Area throughout the period of implementation of the proposed Specific Plan. Although impacts at any one location would be temporary, construction of individual projects could cause adverse effects on local air quality. Construction activities would generate substantial amounts of dust primarily from "fugitive" sources and lesser amounts of other criteria air pollutants primarily from the operation of heavy equipment construction machinery (primarily diesel operated) and construction worker automobile trips (primarily gasoline operated). BAAQMD's approach to analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. BAAQMD considers any project's construction-related impacts to be less than significant if the required dust-control measures are implemented. Without these measures, the impact would be considered significant.

Construction within the Planning Area will likely entail the demolition of most, if not all (except the PG&E substation) existing structures. Available data indicate that at least two of the structures were built prior to 1980. Due to the likely existence of asbestos and lead dust, demolition activities in the Planning Area are subject to the requirements of BAAQMD Regulation 11, Rule 2.

The proposed Specific Plan entails large amounts of grading, including the potential removal of the two hills in the southeast quadrant. The General Plan requires that BAAQMD dust abatement actions are implemented at all construction sites (Policy 10.6.2a, as implemented by the City's Grading and Erosion Control Ordinance). Therefore, the air quality impacts from construction in the Planning Area are less than significant.

Specific Plan Policy that Reduces the Impact

In addition to the General Plan policies, implementation of the Specific Plan policies listed below would reduce the impact of construction activities in the Planning Area on air quality:

EH-40 At sites with known contamination issues, a Construction Risk Management Plan (RMP) shall be prepared and approved prior to commencement of construction, to protect the health and safety of construction workers and site users adjacent to construction activities.

EH-44 On parcels with existing structures, project sponsors shall submit to the City a project Demolition Plan that addresses onsite and offsite chemical and physical hazards. The Demolition Plan shall contain:

- Information for any existing structures or buildings, regarding the presence of hazardous building materials such as asbestos-containing building materials, PCBs, and lead-based paint in existing buildings proposed for demolition, additions, or alterations;
- Protocols for ensuring the safety of workers and the public during demolition or construction activities, as approved by the City. These protocols will include, but are not limited to:
  - Prior to demolition, hazardous building materials shall be removed and appropriately disposed of in accordance with all applicable guidelines, laws, and ordinances.
  - The demolition of buildings containing asbestos requires that licensed asbestos abatement contractors are retained and the Bay Area Air Quality Management District (BAAQMD) is notified ten days prior to initiating construction and demolition activities.
  - The Cal-OSHA-specified method of compliance for demolition activities involving lead-based paint including required respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, and training shall be required.
  - Any electrical transformers and fluorescent light ballasts that do not have labels stating that they do not contain PCBs, shall be treated as hazardous waste and are subject to all hazardous waste regulations.

Mitigation Measures

No mitigation measures are required.

3.3 Biological Resources

ENVIRONMENTAL SETTING

This section identifies and describes the existing biological resources within the Hillcrest Station Area Specific Plan Area (referred to throughout this section as "Planning Area"), as well as in surrounding areas (referred to throughout this section as "Study Area"); and identifies the federal, state, and local regulations pertaining to biological resources within the Study Area. Information used in the preparation of this section was obtained from regional biological studies, existing biological reports on the Planning Area (Entomological Consulting, 2005; RCL, 2005, RCL, October 2008, Live Oak Associates, September 2008), the California Natural Diversity Database (CNNDB, 2008), California Native Plant Society Electronic Inventory (CNPS, 2008), U.S. Fish and Wildlife Service (USFWS) (USFWS, 2008), and standard biological literature.

Vegetation types and wildlife habitats were identified using both records and field observations. An ESA biologist conducted reconnaissance-level field surveys of the Planning Area on April 2, 2008 to gather information and verify existing data on vegetative communities, wildlife habitats, and habitat use on and surrounding the site.

PHYSICAL SETTING

Regional Setting

The Planning Area is located in the East Antioch Creek Watershed, south of the San Joaquin River, in eastern Contra Costa County. It is located in the Bay Area-Delta Bioregion (as defined by the State's Natural Communities Conservation Program). This Bioregion comprises a variety of natural communities, which range from tidal salt marshes to chaparral to oak woodlands. The high diversity of vegetation and wildlife found in Contra Costa County, which reflects that of the region as a whole, is a result of topographic and micro-climate diversity that promotes relatively high levels of endemism. This has, in combination with the rapid pace of development in the region, resulted in a relatively high degree of endangerment for local flora and fauna.

The East Antioch Watershed contains one major tributary, East Antioch Creek, originating from the foothills to the east. East Antioch Creek flows from east to northwest, draining into the Delta during winter storm events. In addition to storm flows collected in the grassland areas of the upper watershed, the Creek receives diverted runoff from streets, houses, and parking lots from urbanized areas, the dominant land cover. Detention basins and levees have been built along the Creek to promote infiltration and prevent the floodwaters from moving into adjacent subbasins. Approximately 13 percent of the main East Antioch Creek channel flows through underground culverts (Jones & Stokes, 2006).

Local Setting

With the exception of two steep hills located along the southern site boundary adjacent to Highway 4, the Planning Area is a shallow valley bisected by East Antioch Creek, which flows from southeast to northwest across the site, eventually discharging into the San Joaquin River approximately 1.5 miles to the northwest. East Antioch Creek is fed by both storm water and irrigation runoff from adjacent and upstream residential developments. Two Contra Costa County

Flood Control detention basins are located along East Antioch Creek within the Planning Area – the Oakley and Trembath Basins. These detention basins help to promote infiltration and detain flood flows (RCL, 2005). While most of East Antioch Creek is surrounded by urban development, within the Planning Area the Creek is adjacent to nonnative grassland and wetlands, as described below.

Topography varies from gentle slopes of 2-3 percent on the valley floor to 15-30 percent slopes on the hilly areas in the southeast. Elevations range from approximately 20 feet above mean sea level at the western edge of the site, to approximately 200 feet in the southeast (RCL, 2005).

Most of the Planning Area is undeveloped. Current development includes the Southern Pacific Railroad which runs east-west through the Planning Area, a few houses, one industrial facility, a paving company, and an auto-towing yard. Historically there was also a chemical fertilizer plant, a sand pit, and limited agricultural use.

Wetlands

On January 31, 2008, the Army Corps of Engineers (Corps) verified that approximately 16.14 acres of waters of the United States, including wetlands, are present within the Planning Area. Specifically, there is coastal/valley freshwater marsh in and along the perennial East Antioch Creek and the unnamed tributary to East Antioch Creek, two ponds, and ruderal seasonal wetlands.

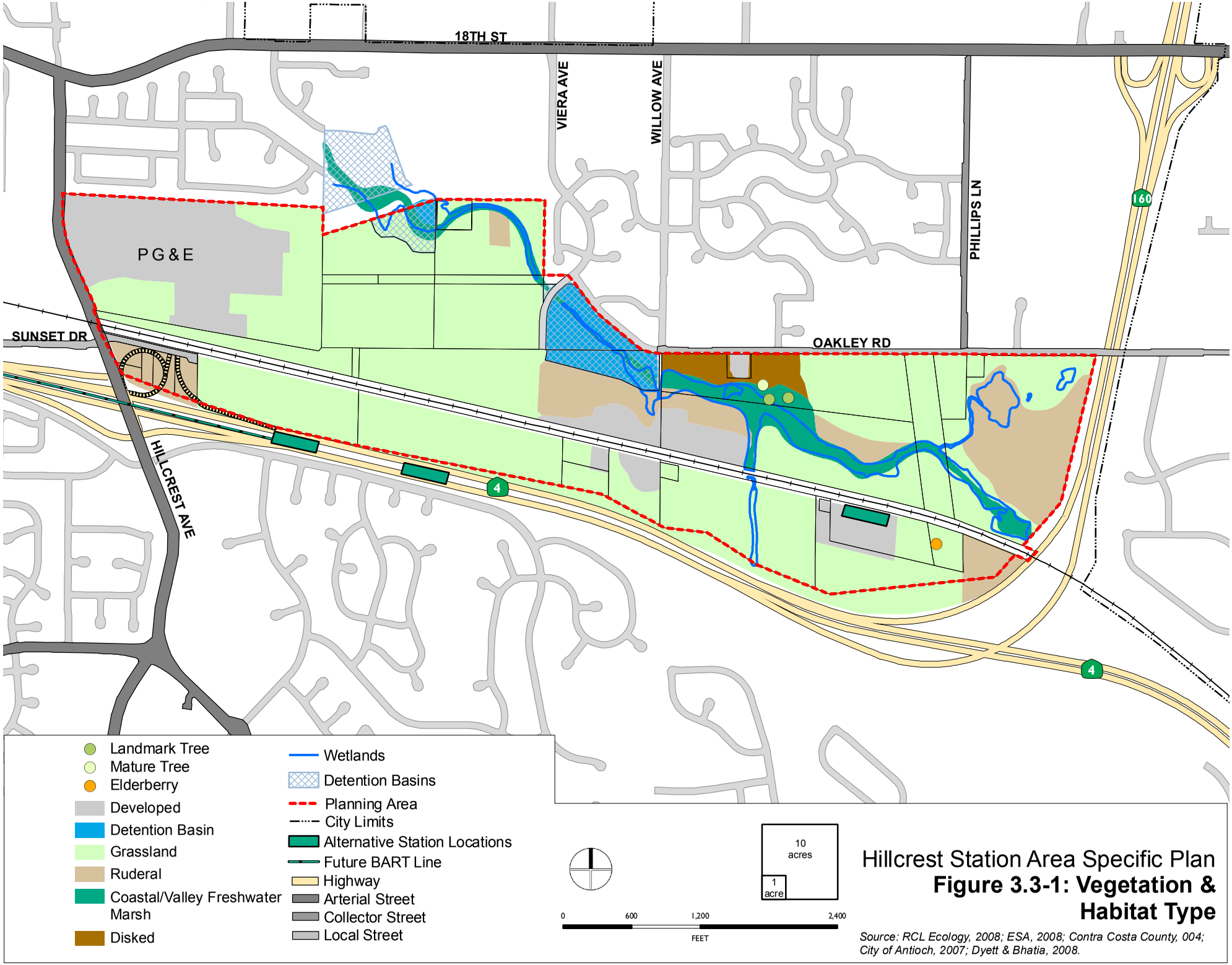
Vegetative Communities and Wildlife Habitat Types

The Planning Area is predominantly annual grassland and ruderal habitat, but also composed of urban areas, freshwater marsh, and ruderal seasonal wetlands (Figure 3.3-1).

Urban Habitat

Urban areas include those that are completely barren; areas that are developed, with buildings and pavement present; and landscaped areas associated with the few residences within the Planning Area, and along roads.

Developed and landscaped areas provide limited wildlife habitat and generally support only generalist and non-native wildlife species that are tolerant of human presence and activities, such as house sparrow (*Passer domesticus*), European starling (*Sternus vulgaris*), house finch (*Carpodacus mexicanus*), northern mockingbird (*Mimus polyglottos*), Anna's hummingbird (*Calypte anna*), Norway rat (*Rattus norvegicus*), and house mouse (*Mus musculus*). The abandoned or underutilized structures, such as those on the south side of the railroad tracks, are potential roost sites for several special-status bat species, including the pallid bat (*Antrozous pallidus),* Townsend's big-eared bat (*Corynorhinus townsendii*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), and Yuma myotis (*Myotis yumanensis*).



Hillcrest Station Area Specific Plan

Figure 3.3-1: Vegetation & Habitat Type

Source: RCL Ecology, 2008; ESA, 2008; Contra Costa County, 004; City of Antioch, 2007; Dyett & Bhatia, 2008.

Annual Grassland/Ruderal Habitat

Annual grasslands dominate the Planning Area. They have been greatly influenced by a variety of past uses such as dryland farming, livestock grazing, almond orchards, off-road vehicles, dumping, sand mining, and residential and commercial activities (RCL, 2005). These grasslands are composed of non-native grasses, including wild oats (*Avena* sp.), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Lolium multiflorum*), common vetch (*Vicia sativa*), rose clover (*Trifolium hirtum*), soft chess (*Bromus hordeaceus*), hoary mustard (*Hirschfeldia incana*), chicory (*Cichorium intybus*), and yellow star thistle (*Centaurea solstitalis*). There are occasional trees throughout this habitat, including the invasive tree of heaven (*Ailanthus altissima*), Peruvian peppertree (*Schinus molle*), almond trees (*Prunus dulcis*), California black walnut (*Juglans californica*), Russian olive (*Elaeagnus angustifolius*), and eucalyptus (*Eucalyptus sideroxylon*) (RCL, 2005).

Annual grasslands and ruderal vegetation may provide refuge for reptiles such as western fence lizard *(Sceloporus occidentalis),* alligator lizard (*Elgaria multicarinata)*, and garter snake (*Thamnophis* spp*.),* as well as grassland birds such as the western meadowlark (*Sturnella neglecta*), loggerhead shrike (*Lanius ludovicianus*), and horned lark (*Eremophila alpestris*) (the latter two which are California Species of Special Concern). Grasslands also serve as important foraging grounds for aerial and ground-foraging insect eaters, including several bat species. Mammals such as Botta's pocket gopher *(Thomomys bottae),* California ground squirrel (*Spermophilus beecheyi)*, and western harvest mouse *(Reithrodontomys megalotis)* commonly forage within urban and disturbed grasslands. These small rodents may attract raptors, including red-tailed hawk (*Buteo jamaicensis),* and American kestrel (*Falco sparverius)*. The white-tailed kite (*Elanus leucurus*) and burrowing owl (*Athene cunicularia*), both California Species of Special Concern, have recently been observed nesting and foraging in the Study Area's grasslands (CDFG, 2008).

Freshwater Marsh Habitat

There are approximately 13.27 acres of freshwater marsh in and along East Antioch Creek, in the Planning Area. These wetlands are dominated by narrow-leaved cattail (*Typha angustifolia*). Other common species present include peppergrass (*Lepidium latifolium*), Italian thistle (*Cynara cardunculus*), and water parsley (*Oenanthe sarmentosa*). Where ponded water occurs within the marsh, willows such as red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*) are found along the banks. The seasonally wet flood plain portion of the marsh is dominated by creeping wildrye (*Leymus triticoides*) and associated species such as Italian ryegrass, Mediterranean barley (*Hordeum marinum* var. *gussoneanum*), willow herb (*Epilobium brachycarpum*), and curly dock (*Rumex crispus*) (RCL, 2005).

Species commonly associated with freshwater marsh include pied-billed grebes (*Podilymbus podiceps*), great blue herons (*Ardea herodias*), great egrets (*Casmerodius albus*), black phoebe (*Sayornis nigricans*), red-winged blackbird (*Agelaius phoeniceus*), marsh wrens (*Cistothorus palustris*), song sparrows, raccoons, and California voles (*Microtus californicus*). The saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), a California Species of Special Concern, is known to breed in this habitat.

Common mammals associated with willow habitat such as that found along East Antioch Creek, include mule deer, raccoon, gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), deer mouse, harvest mouse, dusky-footed woodrat (*Neotoma fuscipes*), and western red

bat (*Lasiurus blossevillii*). Numerous birds are also associated with this cover type, including yellow warbler (*Dendroica petechia*), northern flicker, Bewick's wren, Cooper's hawk, and song sparrows. Of these species, the western red bat, yellow warbler, and Cooper's hawk are all California Species of Special Concern.

Ruderal Seasonal Wetland Habitat

There are approximately 2.87 acres of ruderal seasonal wetlands and a drainage swale in the the disturbed soils within the old sand pit in the northeastern corner of the Planning Area, that captures runoff from Oakland Road and adjacent residences, as well as a road drainage from Highway 160. Plant species occurring in this type include spiny cocklebur (*Xanthium spinosum*), foxtail (*Alopecurus aequalis*), curly dock, rabbitfoot grass (*Polypogon monspeliensis*), narrow-leaf milkweed (*Asclepias fascicularis*), pappose tarweed (*Centromadia parryi* var. *parryi*), and Fremont cottonwood (*Populus fremontii*) (RCL, 2005).

A number of shorebirds may forage around the edges of this complex, including killdeer (*Charadrius vociferous*), black-necked stilt, greater yellowlegs, and gull species.

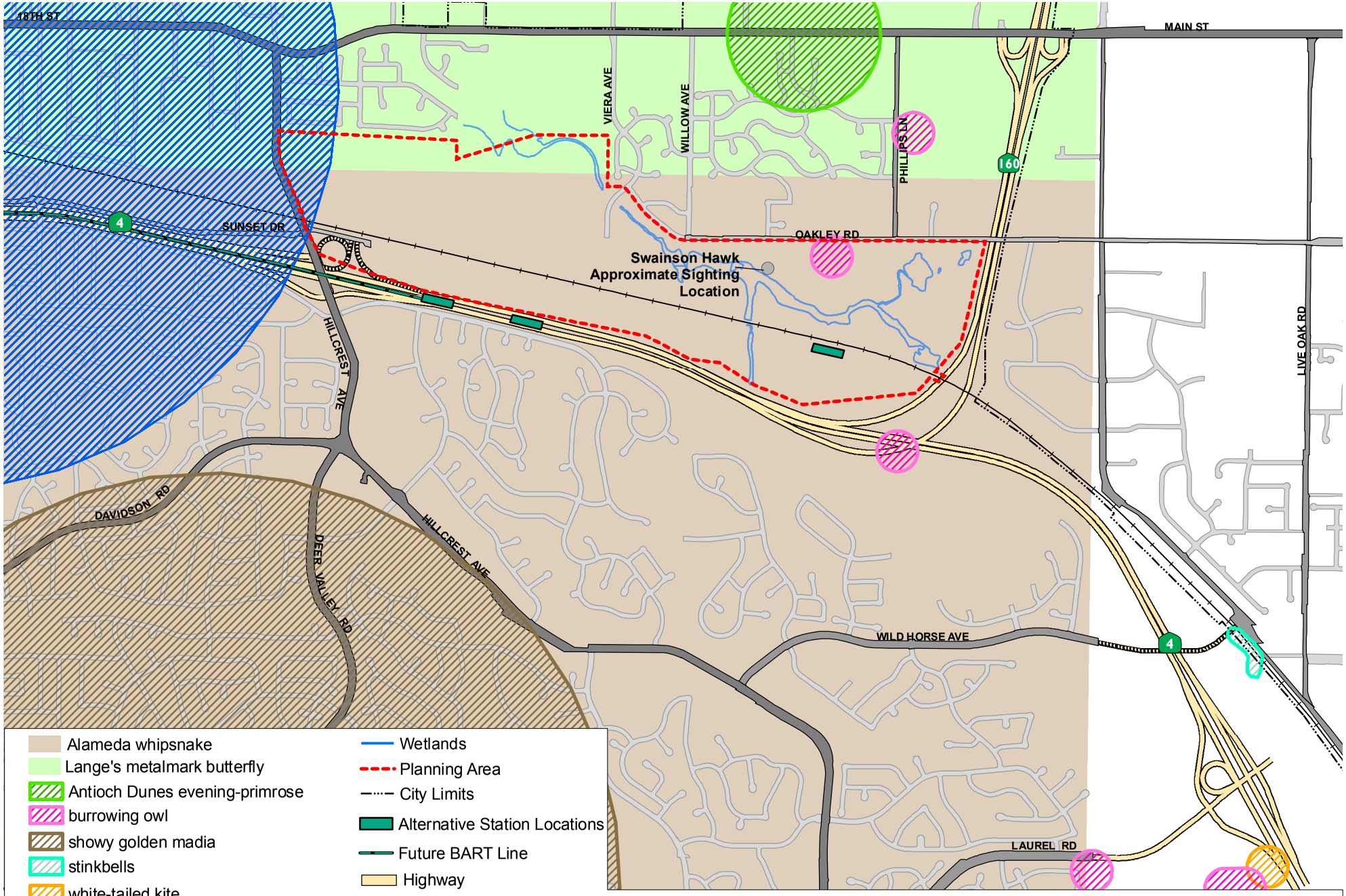
Ponds

There are two ponds in the Planning Area – a larger 0.26-acre pond within East Antioch Creek just east of Willow Ave (hereafter called "large pond"), and a smaller 0.03-acre pond within the unnamed tributary to East Antioch Creek just south of the Southern Pacific Railroad crossing (hereafter called "small pond"). Ponds are small perennial or seasonal water bodies dominated by little or no vegetation. Within the large pond, dense riparian such as red and arroyo willow (*Salix laevigata* and *Salix lasiolepis*) and Himalayan blackberry (*Rubus discolor*) surround most of the pond. Aquatic species within the pond consist of water parsley (*Oenanthe sarmentosa*) and pondweed (*Potamogeton nodosus*). If vegetation is present, it is typically submerged or floating. Largemouth bass (*Micropterus salmoides*) have been introduced into the large pond by a local resident. Other species inhabiting this pond include mosquitofish (*Gambusia affinis*), Pacific tree frog, red swamp crayfish (*Procamburs clarkia*), northern river otter (*Lontra canadensis*), and a variety of common aquatic insects such as dragon flies (*Libellula* sp.) and blue darners (*Aeshna multicolor*). The riparian and upland system surrounding the pond provides larger nesting trees for raptors such as the red-tailed hawk, white-tailed kite, and great horned owl (*Bubo virginianus*) (RCL, 2005).

The small pond is inhabited by Pacific tree frogs, red swamp crayfish, and mosquitofish (RCL, 2005). Shore and wading birds such as those associated with the ruderal seasonal wetland (above), are also associated with ponds.

Sensitive Natural Communities

The CNDDB lists one sensitive natural community, stabilized interior dunes, as occurring in the U.S. Geological Survey quadrangles searched for the area surrounding the Planning Area. Although this community as described by Holland (1986) does not occur within the Planning Area, it is found within the Antioch Dunes National Wildlife Refuge, approximately 0.75 miles north. Areas of coastal and valley freshwater marsh (described in *Vegetative Communities and Wildlife Habitat Types*, above), also considered a sensitive community by CDFG and Corps, occurs within and along East Antioch Creek within the Planning Area.



Hillcrest Station Area Specific Plan

Figure 3.3-2: Special Status Species

Source: California Natural Diversity Database, 2008; Contra Costa County, 2004; City of Antioch, 2007; Dyett & Bhatia, 2008.

Special-Status Animal Species

Several species known to occur in the Study Area are protected pursuant to federal and/or state endangered species laws, or were formerly designated as species of concern by the U.S. Fish and Wildlife Service (USFWS) or currently as Species of Special Concern by the California Department of Fish and Game (CDFG). In addition, Section 15380(b) of the CEQA Guidelines provides a definition of rare, endangered, or threatened species that are not included in any listing.[1] Species recognized under these terms are collectively referred to as "special-status species." For purposes of this EIR, special-status species include:

- Plant and wildlife species listed as rare, threatened, or endangered under the federal or state endangered species acts;
- Species that are candidates for listing under either federal or state law;
- Species formerly designated by the USFWS as species of concern or by the CDFG as Species of Special Concern;
- Species protected by the federal Migratory Bird Treaty Act (16 United States Code [USC] Sections 703–711);
- Bald and golden eagles protected by the federal Bald Eagle Protection Act (16 USC 668);
- Species such as candidate and California Native Plant Society (CNPS) List 1 and 2 species that may be considered rare or endangered pursuant to the criteria in Section 15380(b) of the CEQA Guidelines.

Appendix B provides a comprehensive list of the special-status species that have been documented from, or have potential to occur in suitable habitat within, the Study Area. These lists were obtained from the California Natural Diversity Database (CNDDB) (CDFG, 2008), California Native Plant Society (CNPS) Electronic Inventory (CNPS, 2008), the U.S. Fish and Wildlife Service (USFWS, 2008), biological studies in the Study Area (BART, 2008; Entomological Consulting, 2005; Jones & Stokes, 2006; Live Oak Associates, 2008; RCL, 2005), and biological literature of the region. Many of these species have a low potential for occurrence within the Planning Area, and were eliminated from further evaluation because: (1) the Planning Area does not provide suitable habitat, or (2) the known range for a particular species is outside of the Planning Area and/or the immediate area. Species determined to have a moderate or high potential of occurrence in the Planning Area are discussed in detail below. Species documented by the CNDDB within two miles of the Planning Area are shown in Figure 3.3-2.

In 2005, RCL Ecology analyzed the potential for special-status animal species that are known to occur in the Study Area, and did "protocol" site assessments (i.e. according to agency guidelines) for the California tiger salamander (*Ambystoma californiense)*, California red-legged frog (*Rana draytonii*), and burrowing owl. RCL identified one special-status wildlife species in the Planning Area – nesting red-tailed hawks (this species is not threatened/endangered by federal or state law, but is protected by CDFG and federal Migratory Bird Treaty Act [see *Regulatory Framework*, below]) (RCL, 2005). In 2008, Live Oak Associates completed special-status species surveys for the California tiger salamander, California red-legged frog, western pond turtle (*Actinemys*

[1] For example, vascular plants listed as rare or endangered or as List 1 or 2 by the CNPS are considered to meet Section 15380(b) requirements.

marmorata), silvery legless lizard (*Anniella pulchra pulchra*), giant garter snake, tree nesting raptors, burrowing owl, and San Joaquin kit fox (*Vulpes macrotis mutica*). Special-status species observed include nesting Swainson's hawks (*Buteo swainsoni*) and burrowing owls in the Planning Area (2008).

Appendix B identifies 69 special-status wildlife species that have historically occurred or have potential habitat in the Study Area; 21 of these species are further considered in this EIR due to a combination of their rarity or potential habitat in the Study Area: valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), California red-legged frog, western pond turtle, silvery legless lizard, Alameda whipsnake (*Masticophis lateralis euryxanthus*), northern harrier, burrowing owl, great horned owl (*Bubo virginianus*), red-tailed hawk, Swainson's hawk, white-tailed kite, saltmarsh common yellowthroat, loggerhead shrike (*Lanius ludovicianus*), and several bat species (pallid bat [*Antrozous pallidus*], Townsend's big-eared bat [*Corynorhinus townsendii*], western red bat [*Lasiurus blossevillii*], hoary bat [*Lasiurus cinerus*], long-eared bat [*Myotis evotis*], fringed myotis [*Myotis thysanodes]*, long-legged myotis [*Myotis volans*], and Yuma myotis [*Myotis yumanensis*]). These species are discussed in detail below.

Birds

- **Burrowing owl** (*Athene cunicularia*). This species is a former federal species of concern, and California Species of Special Concern. It is a California resident that prefers open grasslands and disturbed sites with existing burrows, elevated perches, large areas of bare ground or low vegetation, and few visual obstructions. Ground squirrel colonies often provide a source of burrows and are typically located near water and areas with large numbers of prey species, primarily insects. Breeding takes place between March and August, with a peak in April and May. Burrowing owls were observed nesting in several locations within five miles of the Planning Area, including 0.1 miles south of the Planning Area in 2003, and 0.25 miles north of the Planning Area in 2005 (CDFG, 2008). In 2008, Live Oak Associate biologists observed a pair of breeding burrowing owls north of East Antioch Creek, within the Planning Area.
- **Great horned owl** (*Bubo virginianus*). Great horned owls are not threatened/endangered by federal or state law, but like other owls, it is protected under California Code 3503 and 3503.5, which prohibits the taking or destroying of any bird or nest in the order of Falconiformes (falcons, kites, and hawks) and Strigiformes (owls). This species occurs throughout North America and is found in a variety of wooded habitats. They prey on small- to medium-sized mammals such as voles, rabbits, skunks, and squirrels. Great horned owls can often be seen and heard at dusk, perched in large trees. They roost and nest in large trees such as pines or eucalyptus, and often use the abandoned nests of crows, ravens, or squirrels (Erlich et al., 1988; Sibley, 2001). Great horned owls may use large trees located within the Planning Area, and may forage over grasslands and marsh habitat along East Antioch Creek for voles and other small mammals.
- **Red-tailed hawk** (*Buteo jamaicensis*). Red-tailed hawks are not threatened/endangered by federal or state law, but like great horned owls, they are also protected under California Code 3503 and 3503.5 (see preceding paragraph). This species is commonly found in woodlands and open country with scattered trees. These large hawks feed primarily on small mammals, but will also prey on other small vertebrates, such as snakes and lizards, as well as on small birds and invertebrates. Red-tailed hawks nest in a variety of trees in urban, woodland, and agricultural habitats.

- **Swainson's hawk** (*Buteo swainsoni)*. The Swainson's hawk is a California threatened species. It is relatively common throughout the lower Sacramento and San Joaquin valleys, where it commonly nests in large oaks, willows, sycamores, and cottonwoods, but also nest in planted trees such as pines, eucalyptus, and redwoods, in or near riparian habitat, scattered trees, or small groves in sparsely vegetated flatlands. While this species is a rare breeder in eastern Contra Costa County, they are occasionally observed nesting as far west as the Planning Area, particularly in small clumps of eucalyptus trees (Jones & Stokes, 2006). They forage in grasslands and agricultural fields as much as ten miles from their nest for mice, gophers, ground squirrels, rabbits, arthropods, amphibians, reptiles, birds, and rarely, fish. Within increasing development in eastern Contra Costa County, foraging habitat is becoming unsuitably small and/or fragmented for the Swainson's hawk.

  There are three recent CNDDB records of Swainson's hawk nests less than five miles east/southeast of the proposed Hillcrest Station Area (CDFG, 2008). In 2008 one Swainson's hawk nest was observed in a Peruvian peppertree in the Hillcrest Station Planning Area (Live Oak Associates, 2008), and they have been observed foraging in the surrounding grasslands and ruderal habitat (BART, 2008; Live Oak Associates, 2008); there are approximately 280 acres of foraging habitat (includes 227 acres grassland, 48 acres ruderal, and 6 acres of disked habitat) within the Planning Area (see Figure 3.3-1).

- **Northern harrier** (*Circus cyaneus*). This species is a California Species of Special Concern. Northern harriers forage along wet meadows, sloughs, savannas, prairies, and marshes. Destruction of marsh habitat is the primary reason for the decline of this species. Northern harriers nest on the ground in shrubby vegetation, usually at a marsh edge. Their nest is built of a large mound of sticks on wet areas, and a smaller cup of grasses on dry sites. They mostly nests in emergent wetland or along rivers or lakes, but may nest in grasslands, grain fields, or on sagebrush flats several miles from water. Suitable habitat is present for this species in the Planning Area.
- **White-tailed kite** *(Elanus leucurus)*. The white-tailed kite is a California Species of Special Concern. It is a California resident that shifts its local distribution in response to available food supplies. Prior to 1895 this species was common to widespread in valley and lower foothill territory, but is now rare in many sections of the state. The white-tailed kite forages in wetlands and open brushlands, usually near water and streams. Oak woodlands, valley oak or live oak, or trees near marshes are used for nesting sites. Their nests are typically a frail platform of sticks, leaves, weed stalks, and similar materials located in tree or bush. A combination of habitats is essential, including open grasslands, meadows or marshes for foraging and isolated dense topped trees for perching and nesting. Large trees in the Planning Area can provide suitable nesting platforms. ESA observed this species foraging in the Planning Area during an April 2, 2008 reconnaissance survey, and there is a 2004 CNDDB record for this species approximately 1.5 miles east of the Planning Area (CDFG, 2008).
- **Saltmarsh common yellowthroat (***Geothlypis trichas sinuosa*). The common yellowthroat is a former federal Species of Concern, and a California Species of Special Concern. It is a small warbler with a complex of subspecies. The saltmarsh subspecies is recognized as a distinct breeding population, with geographic distribution, habitats, and subtle differences in morphological traits that distinguish it from other subspecies. It inhabits tidal salt and brackish marshes in winter, but breeds in freshwater to brackish marshes and riparian woodlands during spring to early summer. Nests are placed on or near the ground in dense emergent

vegetation or shrubs. This species could use the Planning Area's freshwater marsh and riparian habitat along East Antioch Creek, for breeding.

- **Loggerhead shrike** (*Lanius ludovicianus*). The loggerhead shrike is a California Species of Special Concern that inhabits grasslands, woodlands, and scrub. Shrikes are unique among songbirds, in that their diet regularly includes vertebrate prey. They typically hunt from dead trees, tall shrubs, utility wires and fences, and impale their prey on sharp twigs, thorns, or barbed wire. Their nests are well-concealed in densely-foliaged shrubs or trees. Suitable habitat is present for this species in the Planning Area's grasslands and shrub habitat. There is a 2003 CNDDB occurrence of this species approximately 3.5 miles east of the proposed Hillcrest Station Area (CDFG, 2008).

Insects and Invertebrates

An Insect and Invertebrates Site Assessment completed in August 2005 indicates that there is potential for 23 special-status insect and invertebrate species to be found on a portion (280 acres) of the Planning Area (most which are only known from Antioch Dunes, 0.75 miles north of the Planning Area) (Entomological Consulting, 2005). Aside from the valley elderberry longhorn beetle, which has a low to moderate potential for occurrence in the Planning Area, no other species have a moderate or high potential for occurrence in the proposed Hillcrest Station Area, due to the site's degraded nature and lack of suitable host plants (Entomological Consulting, 2005).

- **Valley elderberry longhorn beetle** (*Desmocerus californicus dimporphus*) (VELB). The VELB is a federally threatened species, found in or near riparian areas where its elderberry shrub food plant grows. Only elderberry shrubs with stems at least one inch in diameter at ground level are suitable host plants for this species. The VELB is only known within the Central Valley, and its range includes the northeast corner of Contra Costa County (USFWS, 1999); Antioch lies west of its presumed range. There are no CNDDB records for this species within five miles of the Planning Area (CDFG, 2008). Nevertheless, a cluster of elderberry shrubs is present in the southeast portion of the Planning Area, and may host this species. (BART, 2008)

Amphibians

- **California tiger salamander** (*Ambystoma californiense)* (CTS). The California tiger salamander is listed as federally threatened and a California Species of Special Concern. It inhabits grasslands and oak savanna habitats in valleys and low hills of central and coastal California. Adults spend most of their lives underground, typically in burrows of California ground squirrels (*Spermophilus beecheyi*) and other fossorial mammals. During winter rains, between November and March, adults emerge from underground retreats to breed. Vernal pools, semi-permanent and permanent waters (including stock ponds), and reservoirs are used for egg-laying.

  There are several CNDDB records of CTS within five miles of the Planning Area (CDFG, 2008). The closest of these occurrences, approximately one mile west of the Planning Area, has been extirpated (RCL, 2005). RCL did a protocol site assessment for this species in a portion (280 acres) of the Planning Area, and concluded that the presence of CTS is unlikely, because: (1) they were not observed in the Planning Area; (2) the closest sighting was extirpated; (3) there are non-native predators (largemouth bass, mosquitofish, and red swamp crayfish) present in potential breeding waters; and (4) Highways 4 and 160, and residential

development likely blocks migration into the Planning Area (RCL, 2005). Live Oak Associates did not observe this species during their surveys for this species, and concluded that it is absent from the Planning Area (2008), a conclusion supported by this EIR.

- **California red-legged frog** *(Rana draytonii)* (CRLF). This species is listed as federally threatened and as a California Species of Special Concern. The Planning Area does not occur within the designated critical habitat units for this species in Contra Costa County. CRLF reside in lowlands and foothills in or near permanent or semi-permanent water sources, such as lakes, stock ponds, and slow moving streams with deep pools and dense shrubs or emergent aquatic vegetation. Where water sources are not permanent, CRLF require access to dry-season upland aestivation habitat in the form of mammal burrows. CRLF require at least 11 weeks of permanent water after egg-laying, for larval development.

  CNDDB reports five records of CRLF occurrences within five miles of the Planning Area (CDFG, 2008). There is potential breeding habitat for this species in the larger pond along East Antioch Creek, and the smaller pond in the unnamed tributary that drains into East Antioch Creek. However, RCL did not observe any larvae during sampling at the larger pond, and only tree frog larvae were seen in the smaller pond (RCL, 2005). RCL concluded that CRLF are unlikely to be present in the portion (280 acres) of the Planning Area that they surveyed, because: (1) no CRLF were observed in the Planning Area during reconnaissance surveys; (2) no CRLF are known within five miles of the Planning Area and north of Highway 4; (3) there are non-native predators (largemouth bass and mosquito fish) present in the larger pond; and (4) the Highways 4 and 160, and residential development likely blocks CRLF migration into the Planning Area. In 2008 Live Oak Associates conducted six CRLF surveys during the breeding season and five surveys outside the breeding season, and concluded that CRLF are absent from the Planning Area; this EIR supports this conclusion.

Reptiles

- **Western pond turtle** (*Actinemys marmorata*)**.** The western pond turtle, a former federal species of concern and a California Species of Special Concern, is a thoroughly aquatic turtle found in permanent ponds, rivers, streams, channels, and irrigation ditches with rocky or muddy bottoms, and emergent vegetation. Basking areas used by this species include partially submerged logs, rocks, vegetation mats, and open mud banks. Habitat destruction and stream course degradation are the primary threats to this species. Although suitable habitat is present for this species in the Planning Area, it was not observed during RCL biological surveys (2005), or Live Oak Associates surveys (2008), and is presumed absent from the site.
- **Silvery legless lizard** (*Anniella pulchra pulchra*). The silvery legless lizard is a subspecies of the California legless lizard, a California Species of Special Concern. It occurs primarily in areas with sandy or loose loamy soils such as under sparse vegetation of beaches, chaparral, or pine-oak woodland; or near sycamores, cottonwoods, or oaks that grow on stream terraces. The sandy loam soils of stabilized dunes seem to be especially favored habitat. Antioch is the northern limit of this species' range. There is a 2004 CNDDB record for this species approximately 1.5 miles east of the Planning Area. While the undeveloped sandy areas in the northeast corner of the Planning Area may have at one time been habitat for this species, it is highly sensitive to disturbance such as mining (which occurred extensively in this portion of the Planning Area). Live Oak Associates did not observe the silvery legless lizard during their 2008 surveys in the Planning Area, and it is presumed absent from the site.

- **Alameda whipsnake** (*Masticophis lateralis euryxanthus*). The Alameda whipsnake is a federal and state threatened species, found in chaparral, grasslands near chaparral, coyote brush scrub, and Diablan sage scrub. Rock outcrops and talus slopes are an important feature of high quality habitat because they provide cover and promote lizards, which are important prey for the Alameda whipsnake. The Planning Area is unsuitable habitat for this species, due to its lack of chaparral habitat and rocky outcrops, its habitat isolation, and its history of disturbance. The East Contra Costa County HCP (HCP) maps suitable core habitat and perimeter core habitat as being southwest of the Planning Area (Jones & Stokes, 2006), and Live Oak Associate biologists did not observe this species during their 2008 amphibian and reptile surveys. This species is presumed absent from the site.

Mammals

- **Special-status bat species**. Bats may forage in the Planning Area, particularly over open areas and along East Antioch Creek. Bats may roost in the Planning Area's large trees such as eucalyptus, in willows and cottonwoods along East Antioch Creek, under the Highway 160 overpass, or in underutilized or abandoned buildings (such as those along the southern border of Southern Pacific Railroad). Several special-status bat species that are former federal species of concern and/or California Species of Special Concern could be present in the Planning Area, including: pallid bat, Townsend's big-eared bat, western red bat, hoary bat, long-eared myotis, fringed myotis, long-legged myotis, and Yuma myotis. The CNDDB has a 1998 record of western red bats in the western portion of the Planning Area (CDFG, 2008).

Special-Status Plants

RCL Ecology completed an initial survey for a 280-acre portion of the Planning Area in 2005. They analyzed the potential for 29 special-status plant species that are known to occur in the Study Area, and determined that five of these species have a moderate or high potential to occur in the Planning Area: San Joaquin spearscale (*Atriplex joaquiniana*), round-leaved filaree (*California macrophylla*), diamond-petaled California poppy (*Eschscholzia rhombipetala*), Contra Costa goldfields (*Lasthenia conjugens*), and Antioch Dunes evening primrose (*Oenothera deltoids* ssp. *howellii*). However, RCL did not identify any of these or other special-status species during focused rare plant surveys in their respective flowering periods (2005). PBS&J also did not identify these species during their 2006 rare plant surveys for the eBART EIR, which included the southern portion of the Planning Area (BART, 2008).

ESA did not identify any new special-status plant species with a moderate or high potential for occurrence in the Planning Area, that were not already identified by RCL Ecology (see Appendix B for a complete list of special-status species with a potential to occur in the Specific Plan Planning Area). The Planning Area is dominated by non-native plants and is not likely to have any special-status plant species, due to its history of disturbance from past agricultural practices, sand mining, off-roading, disking, and development.

Wildlife Corridors

East Antioch Creek, with its fairly continuous marsh and willow habitat, serves as a wildlife movement corridor throughout the site. Such corridors provide pathways for daily travel, and potential linkage between populations both upstream and downstream from the Planning Area (RCL, 2005).

REGULATORY SETTING

Definitions

Dripline

The dripline is the area directly located under the outer circumference of the tree branches.

Endemism

Endemism refers to the degree to which the distribution of organisms or taxa are restricted to a geographical region or locality. For example, an organism with worldwide distribution would not be characterized as being endemic to any one place, while an organism found only in California would be characterized as being endemic to the State.

Generalist Species

Generalist species are able to use a variety of habitats and food sources, unlike many special-status species that are closely restricted to a specific habitat type or food source.

Federal Species of Concern

"Former federal Species of Concern" is an informal term not defined in the federal Endangered Species Act. Federal Species of Concern were formerly federal candidates for listing at a level abolished in 1996. The Sacramento Fish and Wildlife Office stopped maintaining the federal Species of Concern list in 2006, but these species are still considered to be at-risk species by other federal and state agencies, as well as various organizations with recognized expertise such as the Audubon Society.

Navigable Waters

Navigable waters are defined as those waters that are subject to the ebb and flow of the tide or that are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Waters of the U.S.

The term "waters of the U.S.," as defined in Code of federal Regulations (33 CFR 328.3[a]; 40 CFR 230.3[s]), includes: (1) all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; (2) all interstate waters, including interstate wetlands; (3) all other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce, including any such waters that are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce; (4) all impoundments of waters otherwise defined as waters of the U.S. under the definition; (5) tributaries of waters identified in numbers (1) through (4); (6) territorial seas; and (7) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in numbers (1) through (6).

Federal Regulations

Federal Endangered Species Act

Under the federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 USC 1533[c]). Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed threatened or endangered species may be present in the Planning Area and determine whether the proposed project will have a potentially significant impact on such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]). Project-related impacts to these species or their habitats would be considered significant in this EIR.

The USFWS also publishes a list of candidate species. Species on this list receive special attention from federal agencies during environmental review, although they are not protected otherwise under FESA. The candidate species are taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened. Project impacts to such species would be considered significant in this EIR.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 USC, Section 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

U.S. Army Corps of Engineers

Wetlands and other waters (e.g., rivers, streams, and natural ponds) are a subset of "waters of the U.S.," and receive protection under Section 404 of the Clean Water Act (CWA). The U.S. Army Corps of Engineers (Corps) has primary federal responsibility for administering regulations that concern waters of the U.S. In this regard, the Corps acts under two statutory authorities: the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters," and the Clean Water Act (Section 404), which governs specified activities in waters of the U.S., including wetlands. The construction of structures, such as tidegates, bridges, or piers, or work that could interfere with navigation, including dredging or stream channelization, may require a Section 10 permit, in addition to a Section 404 permit if the activity involves the discharge of fill. The U.S. Environmental Protection Agency (U.S. EPA) has the ultimate authority for designating dredge and fill material disposal sites and can veto the Corps' issuance of a permit to fill jurisdictional waters of the U.S.

The Corps requires a permit if a project proposes placement of structures within navigable waters and/or alteration of waters of the U.S. Some classes of fill activities may be authorized under waters and wetlands as a jurisdictionally relevant factor. The more recent Rapanos case further Regional General or Nationwide permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species (listed or proposed for listing under the FESA). The Nationwide permit outlines general conditions and may specify project-specific conditions as required by Corps during the Section

404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued by the Corps.

The federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

In recent years several Supreme Court cases have challenged the scope and extent of the Corps's jurisdiction over waters of the United States and have led to several reinterpretations of that authority. The most recent of these decisions are the case of *Solid Waste Agency of Northern Cook County* (SWANCC) *v. the Army Corps of Engineers* (January 9, 2001) and *Rapanos v. United States* (June, 2006). The SWANCC decision found that jurisdiction over non-navigable, isolated, intrastate waters could not be based solely on the use of such waters by migratory birds. The reasoning behind the SWANCC decision could be extended to suggest that waters need a demonstrable connection with a 'navigable water' to be protected under the CWA. The introduction of the term isolated has led to the consideration of the relative connectivity between questioned the definition of "waters of the United States" and the scope of federal regulatory jurisdiction over such waters but resulted in a split decision which did not provide definitive answers but expanded on the concept that a "significant nexus" with traditional navigable waters was needed for certain waters to be considered within the jurisdiction of the Corps.

On June 5, 2007 the EPA and the Corps released guidance on CWA jurisdiction in response to the Rapanos Supreme Court decisions, which can be used to support a finding of CWA coverage for a particular water body when either (a) there is a significant nexus between the stream or wetland in question and navigable waters in the traditional sense; or (b) a relatively permanent water body is hydrologically connected to traditional navigable waters and/or a wetland has a surface connection with that water. According to this guidance, the Corps and the EPA will take jurisdiction over the following waters:

1. Traditional navigable waters, which are defined as all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. Wetlands adjacent to traditional navigable waters; including adjacent wetlands that do not have a continuous surface connection to traditional navigable waters;
3. Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months);
4. Wetlands adjacent to non-navigable tributaries as defined above; that have a continuous surface connection to such tributaries (e.g. they are not separated by uplands, a berm, dike, or similar feature).

The EPA and the Corps claim jurisdiction over the following waters, based on a fact-specific determination of significant nexus, as defined below, to a traditional navigable water: non-navigable tributaries that are not relatively permanent; wetlands adjacent to non-navigable tributaries that are not relatively permanent; and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

The EPA and the Corps *generally* do not assert jurisdiction over the following features: swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

State Regulations

California Endangered Species Act

Under the California Endangered Species Act (CESA), the CDFG has the responsibility for maintaining a list of threatened species and endangered species (California Fish and Game Code Section 2070). The CDFG also maintains a list of candidate species, which are species that the CDFG has formally noticed as under review for addition to the threatened or endangered species lists. The CDFG also maintains lists of Species of Special Concern that serve as watch lists. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the Planning Area, and determine whether the proposed project will have a potentially significant impact on such species. Project-related impacts to species on the CESA endangered list and threatened list would be considered significant in this EIR. In addition, CDFG encourages informal consultation on any proposed project that may impact a candidate species.

CEQA Guidelines

- **Section 15380.** Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the Guidelines primarily to deal with a situation in which a project may have a significant effect on a species that has not yet been listed by either the USFWS or CDFG. Thus, CEQA provides the ability to protect a species from potential project impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

  CEQA also calls for the protection of other locally or regionally significant resources, including natural communities. Although natural communities do not at present have legal protection, CEQA calls for an assessment of whether any such resources would be affected, and requires a finding of significance if there would be substantial losses. Natural communities listed in the California Natural Diversity Database as "high priority for inventory" are considered by CDFG to be significant resources and fall under the CEQA Guidelines for addressing impacts. Local planning documents such as General Plans often identify these resources as well.

- **Section 15065.** Sensitive plant and wildlife species that are not currently listed as endangered, threatened, or rare but would qualify for listing are afforded protection under CEQA. CEQA Guidelines Section 15065 ("Mandatory Findings of Significance") requires that a reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines Section 15380 ("Rare or Endangered Species") provides for the assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing.

California Fish and Game Code

- **Birds**. Birds of prey are protected in California under the Fish and Game Code (Section 3503.5, 1992). Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute a significant impact. Non-raptor native birds receive similar protection under California Fish and Game Code Section 3503. Project impacts to these species would not be considered significant unless the species are known to, or have a high potential to, nest in the Planning Area or rely on it for primary foraging.
- **Plants**. The Native Plant Protection Act of 1977 (Fish and Game Code Sections 1900 et seq.) gives the CDFG authority to designate state endangered, threatened, and rare plants and provides specific protection measures for identified populations.
- **Waterways**. Under Sections 1600-1616 of the California Fish and Game Code, the CDFG regulates activities that substantially divert, obstruct the natural flow of, or substantially change rivers, streams, and lakes. The jurisdictional limits of the CDFG are defined in Section 1602 of the California Fish and Game Code as the bed, channel, or bank of any river, stream, or lake. The CDFG regulates activities that would result in the deposit or disposal of debris, waste, or other materials into any river, stream, or lake and requires a Streambed Alteration Agreement for such activities. Impacts to the jurisdictional area of the CDFG would be considered significant in this EIR.

California Native Plant Society

The California Native Plant Society (CNPS) maintains a list of special-status plant species based on collected scientific information. Designation of these species by the CNPS has no legal status or protection under federal or state endangered species legislation. CNPS designations are defined as follows: List 1A (plants presumed extinct); List 1B (plants rare, threatened, or endangered in California and elsewhere); List 2 (plants rare, threatened, or endangered in California, but more numerous elsewhere); List 3 (plants about which more information is needed – a review list); and List 4 (plants of limited distribution – a watch list). In general, plants appearing on CNPS List 1A, 1B, or 2 meet the criteria of Section 15380 of the CEQA Guidelines; thus, substantial adverse effects to these species would be considered significant in this EIR.

Regional Regulations

Regional Water Quality Control Board

The Regional Water Quality Control Board (RWQCB) regulates waters of the state under the Porter-Cologne Water Quality Control Act. Under Section 401 of the Clean Water Act, the RWQCB has review authority of Section 404 permits. The RWQCB has a policy of no-net-loss of wetlands and typically requires mitigation for impacts to wetlands before it will issue a water quality certification. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state, and prospective dischargers are required to submit a report of waste discharge to the RWQCB and comply with other requirements of the Porter-Cologne Water Quality Control Act.

East Contra Costa County Habitat Conservation Plan

The East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) is intended to provide a comprehensive framework to protect natural resources in the region. In addition, the intent of the Plan is to improve and streamline the environmental permitting process for impacts to endangered and threatened species. The Plan describes how to avoid, minimize, and mitigate the impacts on Covered Species and their habitats while allowing for urban development in selected regions of the County. It also establishes required setbacks for streams, depending on the stream reach type and location. For example, for perennial, intermittent, or 3rd or higher order ephemeral streams, in urban areas, a 50-foot setback is required from the top of bank, measured in aerial perspective; for perennial, intermittent, or 3rd or higher order ephemeral streams in agricultural or natural areas, a 75-foot setback is required (Jones & Stokes, 2006). The City of Antioch is not a participant in the Plan, but its information and conservation strategy represent the prevailing scientific and regulatory consensus.

Antioch General Plan

10.3.2 Resource Management: Open Space Policies

d. Where significant natural features are present (e.g., ridgelines, natural creeks and other significant habitat areas, rock outcrops, and other significant or unusual landscape features), require new development to incorporate natural open space areas into project design. Require dedication to a public agency or dedication of a conservation easement, preparation of maintenance plans, and provision of appropriate long-term management and maintenance of such open space areas.

e. Require proposed development projects containing significant natural resources (e.g. sensitive or unusual habitats, special-status species, habitat linkages, steep slopes, cultural resources, wildland fire hazards, etc.) to prepare Resource Management Plans to provide for their protection or preservation consistent with the provisions of the Antioch General Plan, other local requirements, and the provisions of State and federal law. The purpose of the Resource Management Plan is to look beyond the legal status of species at the time the plan is prepared, and provide a long-term plan for conservation and management of the natural communities found onsite. Resource Management Plans shall accomplish the following:

- Determine the significance of the resources that are found onsite and their relationship to resources in the surrounding area, including protected open space areas, habitat linkages and wildlife movement corridors;
- Define areas that are to be maintained in long-term open space based on the significance of onsite resources and their relationship to resources in the surrounding area, and
- Establish mechanisms to ensure the long term protection and management of lands retained in open space.

f. Encourage public access to creek corridors through the establishment of trails adjacent to riparian resources, while maintaining adequate buffers between creeks and trails to protect sensitive habitats, special-status species and water quality to the maximum extent feasible.

g. Where feasible, incorporate preserve and protect significant existing natural features as part of the design of new development projects rather than removing them. Where preservation of natural features is not feasible, introduce natural elements into project design. Impacts to significant

natural features that cannot be preserved or reintroduced into the project design onsite shall be mitigated off-site.

10.4.2 Resource Management: Biological Resources Policies

a. Comply with the federal policy of no net loss of wetlands through avoidance and clustered development. Where preservation in place is found not to be feasible (such as where a road crossing cannot be avoided, or where shore stabilization or creation of shoreline trails must encroach into riparian habitats), require 1) on-site replacement of wetland areas, 2) off-site replacement, or 3) restoration of degraded wetland areas at a minimum ratio of one acre of replacement/restoration for each acre of impacted onsite habitat, such that the value of impacted habitat is replaced.

b. Preserve in place and restore existing wetlands and riparian resources along the San Joaquin River and other natural streams in the [General Plan] Planning Area, except where a need for structural flood protection is unavoidable.

c. Require appropriate setbacks adjacent to natural streams to provide adequate buffer areas ensuring the protection of biological resources, including sensitive natural habitat, special-status species habitats and water quality protection.

d. Through the project approval and environmental review processes, require new development projects to protect sensitive habitat areas, including, but not limited to, oak woodlands, riparian woodland, vernal pools, and native grasslands. Ensure the preservation in place of habitat areas found to be occupied by state and federally protected species.

- If impacts to sensitive habitat areas are unavoidable, appropriate compensatory mitigation shall be required off-site within eastern Contra Costa County. Such compensatory mitigation shall be implemented through the provisions of a Resource Management Plan ("RMP") as described in Policy 10.3.2.e (see above), except where, in the discretion of the Community Development Director, an RMP is not necessary or appropriate due to certain characteristics of the site and the project. Among the factors that are relevant to determining whether an RMP is necessary or appropriate for a given project are the size of the project and the project site, the location of the project (e.g., proximity to existing urban development or open space), the number and sensitivity of biological resources and habitats on the project site, and the nature of the project (e.g., density and intensity of development).
- Where preserved habitat areas occupy areas that would otherwise be graded as part of a development project, facilitate the transfer of allowable density to other, non-sensitive portions of the site.

e. Limit uses within preserve and wilderness areas to resource-dependent activities and other uses compatible with the protection of natural habitats (e.g., passive recreation and public trails).

f. Through the project review process, review, permit the removal of healthy, mature oak trees on a case-by-case basis only where it is necessary to do so.

g. Preserve heritage trees throughout the [General Plan] Planning Area.

h. Within areas adjacent to preserve habitats, require the incorporation of native vegetation and avoid the introduction of invasive species in the landscape plans for new development.

i. Design drainage within urban areas so as to avoid creating perennial flows within intermittent streams to prevent fish and bullfrogs from becoming established within a currently intermittent stream.

j. Whenever a biological resources survey is undertaken to determine the presence or absence of a threatened or endangered species, or of a species of special concern identified by the U.S. Fish and Wildlife Service or the California Department of Fish and Game, require the survey to follow established protocols for the species in question prior to any final determination that the species is absent from the site.

10.5.2 Resource Management: Open Space Transitions and Buffers Policies

a. Minimize the number and extent of locations where residential, commercial, industrial, and public facilities land use designations abut lands designated for open space and protected resource areas (e.g., lands with conservation easements or set aside as mitigation for development impacts). Where such land use relationships cannot be avoided, use buffers and compatible uses to buffer and protect open space and protected resources from the adverse effects of residential, commercial, industrial and public facilities development.

b. Ensure that the design of development proposed along a boundary with open space or protected resources provides sufficient protection and buffering for the open space and protected resources. The provision of buffers and transitions to achieve compatibility shall occur as part of the proposed development.

c. In designing buffer areas, the following criteria shall be considered and provided for (when applicable) within the buffer areas to avoid or mitigate significant impacts.

- Aesthetics: How will development affect views from adjacent open space areas? What are the sensitive land uses and resources within open space areas and how might they be affected by changes in the visual environment?
- Light and Glare: Will a proposed development result in increased light or glare in open space areas that would impact open space uses or wildlife habitats within that open space?
- Noise: Will noise generated by the proposed development affect the public's quiet enjoyment of public open space? What are the sensitive noise receptors in open space areas and how can impacts on those sensitive receptors be avoided or mitigated? Can noise-generating uses be located away from noise-sensitive areas?
- Fire Safety: How will development affect the risk of fire on adjacent open space and resource areas? How would development affect or be affected by existing fire abatement practices on adjacent open space and resource areas, including livestock grazing, prescribed fire, plant pest management, mowing, disking, ecological restoration and other practices?
- Public Safety: How will development adjacent to open space or resource areas increase the risk of vandalism, trespass, and theft in adjacent open space and resource areas?

- Habitat Management: How will proposed development affect habitat values on adjacent open space and resource areas? How will development prevent the spread of introduced animals and plant pests into adjacent open space and resource areas? How will proposed development affect wildlife migration corridors between or within open space and/or resource areas?
- Public Access Management: How will development adjacent to public open space and resource areas affect the maintenance of existing public facilities, such as roads, trails, fences, gates and restrooms? How might development adjacent to open space or resource areas facilitate illegal public access?
- Buffer Management: How can appropriate management of lands that are set aside as buffers between development and open space or resource areas be ensured?

City of Antioch Tree Ordinance

The City of Antioch Municipal Code provides the guidelines for tree preservation and regulation (Title 9, Chapter 5, Article 12) (City of Antioch, 2008). A permit must be obtained to remove any "established tree" (any tree at least ten inches in diameter at breast height [dbh]), any "mature tree" (any tree at least 26 inches dbh), or any "landmark tree" (any tree at least 48 inches dbh or in excess of 40 feet in height).

According to an October 2008 Arborist's Report for a 284-acre portion of the project area (R&L Ecology, 2008), 112 "established" trees are present in the Planning Area. Of those, 61 are in good or fair condition and recommended to be retained, and 51 are rated in poor condition and recommended for removal. Three "mature" trees were identified, though only one was in fair condition; and two "landmark" trees were identified, both in fair condition. The complete Arborist's Report is included as Appendix E of this EIR.

IMPACT ANALYSIS

The proposed Specific Plan would have a significant adverse impact on biological resources if it would:

SIGNIFICANCE CRITERIA

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service; or
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service; or
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means; or
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

METHODOLOGY AND ASSUMPTIONS

For purposed of this EIR, the analysis considered the following three principal components of the guidelines and criteria outlined above:

- Magnitude of the impact (e.g. substantial/not substantial)
- Uniqueness of the affected resource (rarity)
- Susceptibility of the affected resource to perturbation (sensitivity)

The evaluation of significance must consider the interrelationship of these three components. For example, a relatively small magnitude impact to a state or federally listed species would be considered significant because the species is rare and is believed to be very susceptible to disturbance. Conversely, a plant community such as California annual grassland is not necessarily rare or sensitive to disturbance, and therefore a much larger magnitude of impact would be required to result in a significant impact. Impacts are generally considered less than significant if the habitats and species affected are common and widespread in the region and the state. Impacts are considered beneficial if the action causes no detrimental impacts and results in an increase of habitat quantity and quality.

SUMMARY OF IMPACTS

The proposed Hillcrest Station Area Specific Plan would encompass approximately 375 acres, currently dominated by non-native annual grassland and ruderal habitats. There are several types of jurisdictional wetlands present within the Planning Area, including ruderal seasonal wetlands, a drainage swale, in-channel ponds, and freshwater marsh in and along East Antioch Creek. Wildlife may use East Antioch Creek as a movement corridor, and several birds are known to have recently nested in the Planning Area, including the Swainson's hawk, burrowing owl, and red-tailed hawk. Finally, several "established" trees under the City of Antioch Tree Ordinance currently exist on the site and would likely be removed for buildout, and others will be planted in "landscape buffers," under the proposed Specific Plan. Existing General Plan policies, proposed Specific Plan policies, and mitigation measures would reduce these potentially significant biological impacts to a less than significant level under CEQA.

Though the proposed Hillcrest Station Planning Area is within the boundaries of the East Contra Costa County HCP/NCCP (ECCC HCP), the City of Antioch is not a signatory to the ECCC HCP, and therefore the project sponsor is not required to participate in it. Furthermore, the Specific Plan policies and mitigation measures included in this EIR are at least as stringent as, and in many cases equivalent to, the Conditions and Conservation Measures described in the ECCC HCP. As there is no foreseen conflict between the proposed Hillcrest Station Area Specific Plan and the ECCC HCP, this impact is not analyzed any further.

IMPACTS AND MITIGATION MEASURES

3.3-1 *Construction and development activities under the proposed Specific Plan could impact non-listed nesting bird species protected under the federal Migratory Bird Treaty Act. (Less than Significant)*

Nesting habitat for non-listed birds protected under the federal Migratory Bird Treaty Act occurs in and around the Planning Area. Disturbances due to construction or other activities during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment, and would be considered a significant impact.

Under the proposed Specific Plan, trees, shrubs, and grasslands in areas proposed for development are potential nesting habitat for birds protected under the federal Migratory Bird Treaty Act. It is likely that construction activities would contribute to the destruction or degradation of habitat. Specific Plan policies below ensure that a protocol is followed to schedule construction around the breeding season, and when that is not possible, to adequately survey and avoid nesting areas during construction.

Specific Plan Policies that Reduce the Impact

EH-3 Prior to approval of any subdivisions or development projects, project sponsors shall comply with mitigation measures to avoid impacts to nesting bird species protected under the federal Migratory Bird Treaty Act, as follows:

- Project sponsors will avoid disturbing nesting raptors and other special-status birds by performing construction activities (i.e., ground clearing and grading, including removal of trees or shrubs) outside of the breeding season (February 1 through August 31), to the extent possible.
- If construction activities are scheduled to occur during the breeding season (February 1 through August 31), the project sponsor will implement the following measures to avoid potential adverse effects on nesting raptors and other special-status birds:
  - The project sponsor will retain a qualified wildlife biologist to conduct preconstruction surveys of all potential nesting habitat within 500 feet of construction activities, where access is available. Surveys shall be conducted no more than 14 days prior to the first day of construction activities.
  - If active nests are found during preconstruction surveys, the project sponsor will create a no-disturbance buffer (size to be determined in consultation with CDFG) around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that all young have fledged. The size of these buffer zones and types of construction activities restricted in these areas will be based in part on existing noise and human disturbance levels in the project site. Nests initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the "take" (harm) of any individuals will be prohibited.

- If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs within the construction footprint that are determined to be unoccupied by special-status birds or that are located outside the no-disturbance buffer for active nests, may be removed.

Mitigation Measures

No mitigation measures are required.

3.3-2 ***Construction and development activities under the proposed Specific Plan could impact the Swainson's hawk and supporting habitat. (Less than Significant)***

The Swainson's hawk is a California threatened species under the California Endangered Species Act, and protected under the federal Migratory Bird Treaty Act and CDFG Code. In 2008 the Planning Area contained one Swainson's hawk nest, and approximately 280 acres of foraging habitat; construction activities and development that adversely affects this species would be significant.

Under the proposed Specific Plan, there will be construction activities within 0.25 miles of the 2008 Swainson's hawk nest, and nearby foraging habitat for this species will be developed. CDFG considers nests to be "active" if they are used one or more years within the last five years (CDFG, 1994). Development within the Planning Area is not projected to begin for several years, and this nest could become inactive by the time development activities begin.

Specific Plan Policies that Reduce the Impact

EH-4 Surveys for nesting Swainson's hawks shall be conducted semi-annually by a qualified biologist during the nesting season (March 1-September 15), beginning in the spring of 2009 and continuing until Planning Area development begins.

- Surveys shall be conducted at the beginning of the breeding season (March/April) and towards the end of the season (August/September) to determine the extent of nesting activity.
- Surveys shall be conducted within the Planning Area and extending out 0.25 miles from the Planning Area where possible.
- If potentially occupied nests are within 0.25 miles of the Planning Area and public access is not possible, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the Planning Area.
- Documentation of Swainson's hawk presence shall be submitted to the CDFG California Natural Diversity Database, and annual reports summarizing the results of the surveys shall be submitted to the City.
- Project sponsor(s) shall provide funding to the City of Antioch to contract for the biologist's services.

EH-5 Prior to the approval of a development permit in the Planning Area, the City shall determine whether Swainson's hawks are present in or within 0.25 miles of the Planning Area. Using the semi-annual survey results required in Policy EH-4 and the most recent CEQA environmental review documents for the Planning Area, it will be determined:

- Whether nesting sites are active or have been vacant for the five consecutive years (and therefore "inactive") preceding the application date; and
- If active, the total acreage of Swainson's hawk habitat, both nesting and foraging, that may be disturbed.

EH-6 If active Swainson's hawk nests are identified, a permanent 100-foot buffer shall be created around the dripline of the nest trees.

- No development shall occur within this buffer.
- The buffer shall be fenced to prevent the nests from being disturbed.

EH-7 If it is determined through Policy EH-5 that the Swainson Hawk nest is "active", then the project sponsor shall mitigate for lost Swainson's hawk nesting and foraging habitat using mitigation ratios prepared in consultation with CDFG, through mitigation credits or conservation easements.

- As of 2008 the CDFG recommended the following mitigation ratios, which are subject to change:
  - 1:1 for foraging habitat within one mile of an active nest;
  - 0.75:1 for foraging habitat within one to five miles of an active nest; and
  - 0.5:1 for foraging habitat within five to ten miles of an active nest.
- Mitigated land should be as close as possible to the Planning Area.

EH-8 During the nesting season (March 1–September 15), a qualified biologist shall conduct a preconstruction survey no more than 14 days prior to ground disturbance, to establish whether Swainson's hawk nests within 0.25 mile of the project site are occupied (unless this was already accomplished through Policy EH-4).

- If potentially occupied nests exist within 0.25 mile of the Planning Area, then their occupancy will be determined by observation from public roads or by observations of Swainson's hawk activity (e.g., foraging) near the Planning Area.
- If active Swainson's hawk nests are identified during these pre-construction surveys, no construction activities shall occur during the nesting season within 0.25 mile of occupied nests or nests under construction, unless CDFG/USFWS agrees to a smaller buffer based on environmental conditions such as steep topography or dense vegetation. If young fledge prior to September 15, construction activities can proceed normally.

Mitigation Measures

No mitigation measures are required.

3.3-3 *Construction and development under the proposed Specific Plan could impact the western burrowing owl and its habitat. (Less than Significant)*

The western burrowing owl is a California Species of Special Concern. It is also protected under the federal Migratory Bird Treaty Act and CDFG Code. In 2008, Live Oak Associate biologists observed one pair of burrowing owls nesting in the northeast portion of the Planning Area, and evidence of burrowing owl activity in the southeast portion of the Planning Area (Live Oak Associates, 2008). Adverse impacts to nesting burrowing owls would be significant.

Construction and development under the proposed Specific Plans could adversely affect nesting burrowing owls by removing foraging habitat and threatening burrow locations. However, proposed Specific Plan policies prohibit disturbance during the nesting season, provide guidance for proper relocation procedures outside of the nesting season, and provide for the replacement of foraging habitat or credits for same. These policies will reduce this impact to a less than significant level.

Specific Plan Policies that Reduce the Impact

EH-9 No more than 14 days before construction, a survey for burrowing owls and their burrows shall be conducted by a qualified biologist within 500 feet of the project (access permitting). The survey will conform to the protocol described by the California Burrowing Owl Consortium (1995), which includes up to four surveys on different dates if there are suitable burrows present.

EH-10 If occupied owl burrows are found within the survey area, a determination will be made by a qualified biologist, in consultation with the CDFG, as to whether or not work will affect the occupied burrows or disrupt reproductive behavior.

- If it is determined that construction will not affect occupied burrows or disrupt breeding behavior, construction will proceed without any restriction or mitigation measures.
- If it is determined that construction will affect occupied burrows during the non-breeding season (August through February), the subject owls shall be passively relocated from the occupied burrow(s) according to a plan approved by the CDFG. The plan will include installation of one-way doors in occupied burrows at least 48 hours before the burrows are excavated, and will provide for the owl's relocation to nearby lands that possess available nesting habitat.
- If it is determined that construction will physically affect occupied burrows or disrupt reproductive behavior during the nesting season (March through July), then avoidance is the only mitigation available. Construction will be delayed within 300 feet of occupied burrows until it is determined that the subject owls are not nesting or until a qualified biologist determines that juvenile owls are self-sufficient or are no longer using the natal burrow as their primary source of shelter.

EH-11 If the project requires the mitigation of Swainson's hawk foraging habitat, lost burrowing owl nesting and foraging habitat will be considered effectively mitigated with the acquisition of habitat or habitat credits, which replaces Swainson's hawk foraging habitat (see Plan Policy EH-7).

EH-12 If the project does not require the mitigation of Swainson's hawk foraging habitat, lost burrowing owl habitat shall be compensated by the acquisition or conservation of 6.5 acres per breeding pair using the site, at the time of disturbance.

Mitigation Measures

No mitigation measures are required.

3.3-4 ***Construction and development activities under the proposed Specific Plan could result in disturbance to special-status bat species. (Less than Significant)***

Buildings, trees, and shrubs in and surrounding the proposed project area provide suitable foraging and roosting habitat for special-status bat species, including Townsend's big-eared bat, pallid bat, western red bat, hoary bat, long-eared myotis, fringed myotis, long-legged myotis, and Yuma myotis. These bats are protected as former federal species of concern and/or California species of special concern, and any "take" of these species would be significant. In addition, the loss of an active breeding maternity roost of a relatively common species like the big brown bat or California myotis, would also potentially be a significant impact, because these maternity roosts are protected by §4150[2] of the CDFG Code.

The proposed Specific Plan would result in the removal of several trees and shrubs, as well as abandoned buildings. Potential impacts to bats within the Planning Area include direct mortality as a result of roost destruction, and indirect impacts if bats abandon their roosts due to construction noise and human disturbance. However, Specific Plan Policy 3.3(c) reduces this potential impact to bats to a level that is less than significant.

Specific Plan Policies that Reduce the Impact

EH-13 The project sponsor will avoid disturbance of hibernating or maternity bat roosts, by performing preconstruction surveys and creating no-disturbance buffers.

EH-14 Prior to construction activities (i.e., ground clearing and grading, including removal of trees or shrubs) within 200 feet of trees and buildings that potentially support special-status bats, the project proponent will retain a qualified bat biologist to survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, strong odors) is present, no further mitigation is required.

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[2] Section 4150 of the Fish and Game Code states that all non-game mammals (which includes bats) or parts thereof may not be taken or possessed except as otherwise provided in the code or in accordance with regulations adopted by the commission. Thus, activities that result in direct mortality of bats, or disturbance that causes the loss of a maternity colony (and consequent death of young bats), is prohibited.

EH-15 If evidence of bats is observed, the project sponsor will carry out the following measures to avoid potential adverse effects to bats:

- A no-disturbance buffer (acceptable in size to the CDFG) will be created around active roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected, and no buffer would be necessary. However, the take of individuals will be prohibited.
- Removal of trees/buildings showing evidence of bat activity will occur during the period least likely to affect bats, as determined by a qualified bat biologist (generally between February 15 and October 15 for winter hibernacula, and between August 15 and April 15 for maternity roosts). If exclusion is necessary to prevent indirect impacts to bats due to construction noise and human activity adjacent to trees showing evidence of bat activity, these activities will also be conducted during these periods.

Mitigation Measures

No mitigation measures are required.

3.3-5 ***New development under the proposed Specific Plan could result in disturbance to the valley elderberry longhorn beetle. (Less than Significant)***

Although unlikely, there nevertheless is the potential for valley elderberry longhorn beetle (VELB) presence in the elderberry shrubs located in the southeast corner of the Planning Area. Impacts to the VELB would be significant.

Under the proposed Plan, the location of elderberry shrubs is zoned as "transit area mixed use," and there is potential for impacts to these shrubs and the VELB.

Specific Plan Policies that Reduce the Impact

EH-16 The project sponsor shall avoid Valley Elderberry Longhorn Beetle (VELB) habitat or prepare a VELB Mitigation Plan:

- Regardless of whether or not VELB exit holes are present, all elderberry shrubs with stems at least one inch in diameter shall be avoided, and a 100-foot buffer shall be established around the dripline of the shrubs. The 100-foot buffer may be adjusted in consultation with the USFWS. If avoidance is achieved, a letter report confirming avoidance shall be sent to the USFWS and no further mitigation would be required.
- If disturbance within 100 feet of the dripline of the elderberry shrubs with stems greater than or equal to one inch in diameter is unavoidable, then the project sponsor will: (1) conduct surveys for the VELB in accordance with the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS, 1999); and (2) mitigate for impacts in accordance with these guidelines (USFWS, 1999).

Mitigation Measures

No mitigation measures are required.

3.3-6 *New development under the proposed Specific Plan could degrade streams, wetlands, and riparian habitats potentially subject to state and federal protection. (Less than Significant)*

Wetlands, streams, and ponds are present within the Planning Area, and potential direct impacts to these resources include filling, diversion, contamination, and siltation, all of which could be significant. Indirect effects on the retained Creek corridor would also be significant, and could include predation and harassment of the Creek's wildlife by pets, vandalism, dumping of trash, noise pollution, light pollution, introduction of nonnative plant and wildlife species (the proliferation of invasive species within an area leads to the loss of biodiversity since they displace native plants and frequently decrease wildlife habitat), and increased runoff from adjacent streets and landscaped areas containing lawn fertilizer, pesticides, and vehicle waste into the Creek. The planned 75-foot buffer around East Antioch Creek's wetlands would minimize these indirect impacts, by protecting biological resources such as sensitive wetlands, protecting wildlife utilizing the wetlands and adjacent habitat, maximizing the natural flood protection value of the floodplain, and protecting water quality by filtering sediments and pollutants from urban runoff before they reach the Creek.

Under the proposed Plan, jurisdictional wetlands would be developed, including the seasonal wetlands and drainage swale in the northeast portion of the Planning Area, and areas of freshwater marsh (the unnamed tributary of East Antioch Creek) in the central and eastern portions of the Planning Area. Although most direct impacts to the East Antioch Creek corridor would be avoided, there could be indirect impacts to this corridor, as described above.

Existing Policies and Regulations on Wetlands

As described in *Regulatory Setting*, above, all projects that discharge into or fill waters of the United States, including jurisdictional wetlands, are required to obtain applicable permits from the Corps; all projects that discharge into or fill waters of the State, including jurisdictional wetlands, are required to obtain applicable permits from the RWQCB; and projects that fill streams under the jurisdiction of the State are also required to obtain a Streambed Alteration Agreement from CDFG. The wetlands within the Hillcrest Planning Area fall under the jurisdiction of all three of these agencies, and therefore permits from these agencies will be required prior to construction activities. These permits will require avoidance measures for any retained wetlands, and mitigation for any temporary or permanent impacts to wetlands, either through protection/restoration of existing wetlands, or creation of new wetlands.

Furthermore, the Antioch General Plan has an extensive set of existing policies that protect these resources. Please return to the *Regulatory Setting* for the detailed list.

Specific Plan Policies that Reduce the Impact

EH-17 The project sponsor will avoid or minimize effects on streams, ponds, wetlands, and riparian habitat when possible. If underground utility crossings are required underneath East Antioch Creek, contractors shall employ jack-and-bore construction techniques for these crossings.

EH-18 For impacted wetlands, the project sponsor shall restore/create wetlands on or off site at a 2:1 ratio. A wetland mitigation and monitoring plan (referred to in General Plan Policies 10.3.2(e) and 10.4.2(d) as a Resource Management Plan) shall be developed and submitted to the Corps and any other applicable agencies, that includes the following:

- description of wetland types;
- performance standards and monitoring protocol to ensure the success of the mitigation wetlands over a period of five to ten years;
- engineering plans showing the location, size, and configuration of wetlands to be created or restored, as applicable;
- an implementation schedule showing when construction of mitigation areas shall occur, as applicable; and
- a description of legal protection measures for preserved wetlands, as applicable (i.e., dedication of fee title, conservation easement, and/or an endowment held by an approved conservation organization, government agency, or mitigation bank).

EH-19 As part of the development review process for projects adjacent to or including East Antioch Creek, the project sponsor shall create a Resource Management Plan for the creek corridor, as required by the General Plan Policy 10.4.2(d), in order to retain native vegetation in and along East Antioch Creek and prevent its degradation. Components of this Plan shall include but are not limited to: a vegetation palette consisting of native species for any landscaping that the project sponsor would like to do within the corridor, and methods for plant installation; vegetation monitoring; herbivore and weed control; irrigation; and site protection.

EH-20 The project sponsor shall establish a minimum 50-foot buffer from the delineated edge of the wetlands and the freshwater marsh vegetation. No development shall occur within this buffer.

- In an effort to avoid impacts to wildlife, including nesting birds and sensitive habitats, a fence shall be erected between the outer edge of the buffer area and the development, to keep pets out. The fence shall be at least four feet in height.
- A 25-foot additional buffer containing a recreation trail composed of permeable or semi-permeable surface may be located outside of the 50-foot buffer.

EH-21 Pedestrian and vehicle bridges proposed to cross over East Antioch Creek shall be designed to span the bed and bank of streams and avoid or minimize bridge piers or footings within the stream, within bridge safety limits.

- If possible, the span of bridges that cross streams should also include some upland habitat beneath their spans to provide dry areas for wildlife species that do not use creeks or for use during storms.
- Native plantings, natural debris, or rocks should be installed under bridges to provide wildlife cover and encourage the use of crossings.

Mitigation Measures

No mitigation measures are required.

3.3-7 ***New development under the proposed Specific Plan could interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant)***

The Planning Area is surrounded by development and has little value as a wildlife corridor, except for possibly those species moving along or inside East Antioch Creek. Policies described in Impact 3.3-6 that require a buffer to this creek (i.e. General Plan Policy 10.3.2(e), and Specific Plan Policy EH-x and EH-x) would protect this movement corridor.

Under the proposed Plan, there will be a buffer around East Antioch Creek, which will serve as a movement corridor for wildlife species. The plan is not expected to impede wildlife movement in the Planning Area.

Specific Plan Policies that Reduce the Impact

EH-22 Provisions shall be made for wildlife under-crossings for new roads near East Antioch Creek. Tunnels or culverts must be the minimum length, height, and width necessary to provide safe passage under the road. Culvert designs will be based on the best available data at the time of the development application.

Mitigation Measures

No mitigation measures are required.

3.3-8 ***The proposed Specific Plan could conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant)***

The City of Antioch Municipal Code 9-5.12 describes measures that protect trees, including "established" trees, which are present on the site. The City of Antioch has also passed ordinances that aim to protect native flora and fauna, by avoiding nonnative species introductions. Conflicts with these policies and ordinances would be significant.

Under the proposed Plan, trees will be planted in the "landscape buffer" area, and several trees that the City of Antioch has defined as "established" and therefore deserving of protection will be removed. Though the Arborist's Report identified a total of 112 established trees on the site, only 61 of those were evaluated as of good or fair condition and meriting preservation. Of the 61, only three are landmark or mature trees. The cluster of these three particular trees adjoins the creek buffer proposed in the Specific Plan and described above under Impact 3.3-7. Nonetheless, as all established trees overall are protected by the Tree Ordinance, any removal in conflict with the Ordinance would constitute a potentially significant impact. The following Specific Plan policies reduce this potentially significant impact to a level that is less than significant.

Specific Plan Policies that Reduce the Impact

EH-23 All "established" trees that will be retained shall be adequately protected during grading and construction.

- Trees to be preserved immediately adjacent to the construction area should be protected with a minimum four-foot construction fence placed at least three feet outside the tree's dripline.
- Care should be taken not to change the grade of the protected trees either by fill or grading. Any proposed grading within the dripline of protected trees will require further site investigation and recommendations by a certified arborist.

EH-24 Trees to be retained at the edge of the construction area should be pruned prior to the start of construction to remove dead wood that might present a safety hazard. Trees to be retained in landscape buffers and open space areas should be pruned of dead wood to minimize human hazards.

EH-25 The project sponsor will guarantee the health of all trees to be preserved within and adjacent to the proposed project site for three years. The project sponsor will replace any tree that is to be retained but that dies as a result of project construction activities during the guarantee period, with two 24-inch box, native trees, and the City of Antioch may require the posting of a bond pursuant to the Municipal Code.

EH-26 A plan for control of the Tree of Heaven species should be prepared and implemented in order to prevent root and sprout damage to concrete and asphalt pavement and building foundations.

Mitigation Measures

No mitigation measures are required.

CUMULATIVE ANALYSIS

This analysis evaluates whether the impacts of the proposed Project, together with the impacts of cumulative development, would result in a cumulatively significant impact on special-status species, wetlands and other waters of the U.S., or other biological resources protected by federal, state, or local regulations or policies (based on the significance criteria and thresholds presented earlier). This analysis then considers whether the incremental contribution of the Hillcrest Station Specific Plan to this cumulative impact would be considerable. Both conditions must apply in order for a project's cumulative effects to rise to the level of significance. The geographic context for analysis of cumulative impacts to biological resources includes sites within and adjacent to the Hillcrest Station Planning Area.

East Contra Costa County is one of the fastest growing areas in the San Francisco Bay region. Between 2000 and 2030, population in the SR 4 corridor is projected to increase from about 167,700 people to 232,000 people (about 38 percent). During that same timeframe, population in the County is expected to increase from a population of about 948,800 to 1,255,300 (about 32 percent), and the population of the Bay Area is likely to increase in population from roughly 6.8 to 8.7 million (about 28 percent). The more rapid growth rate projected for the project corridor

indicates that the corridor is forecast to house an even greater proportion of the Bay Area's growth in 2030 than it does currently.

Within eastern Contra Costa County, there are approximately 58,840 acres of annual grassland, and 6,188 acres of ruderal habitat (Jones & Stokes, 2006). The annual grasslands are predominantly located in the southwest portions of eastern Contra Costa County, while ruderal habitat is located primarily in small patches throughout the urban areas. While large tracts of undeveloped grasslands and woodlands are present a few miles south of the Planning Area, which provide suitable habitat for several special-status species, and sensitive communities that also support special-status species are located approximately one mile north of the Planning Area, the Planning Area itself is an island of predominantly disturbed grassland and ruderal habitat, completely surrounded by development.

Past projects are the principle determinant of existing conditions in the Planning Area. While open space persists within and nearby the Planning Area, much of the original extent of the natural habitat once present has been developed. Development including SR 4, SR 160, residential lots, and business parks, have already caused significant adverse cumulative effects on biological resources through habitat loss and fragmentation, as well as the introduction of night lighting and noise. With the addition of current and other proposed projects, there is an existing cumulative impact without the project, which could be considered to combine with the proposed project to increase the aggregate effect and be considered cumulatively significant.

Development in the Planning Area, the future eBART, and other nearby projects will continue to fragment an already highly fragmented landscape in an urban environment, with essentially no wildlife movement corridors remaining except along creeks (although even the creeks in the vicinity of the Planning Area are of poor quality due to loss of riparian vegetation and culverted sections). Currently developed lands lack suitable habitat for most special-status species, and remaining pockets of undeveloped land in the vicinity of the Planning Area have a relatively low biological value, because (1) their highly fragmented nature makes wildlife access difficult; (2) their history of disturbance has eliminated suitable habitat for many special-status plants and animals; and (3) their small size cannot support viable populations of many wildlife species. Therefore, overall biological value in the urban area including the Hillcrest Station Planning Area is considered low.

The current impact analysis has shown that, while the Hillcrest Station Specific Plan has the potential for relatively minor impacts on burrowing owls, Swainson's hawks, and other potential special-status species, these impacts can be minimized to less than significant levels through the application of this EIR's proposed Specific Plan policies. When considered relative to all past, present, and reasonably foreseeable similar projects within the geographic context for this analysis, the incremental contribution of the proposed projects under this Specific Plan (which includes a loss of less than one percent of existing annual grasslands and ruderal habitat available in eastern Contra Costa County) to an already existing cumulative impact, is not cumulatively considerable. Therefore, the cumulative effect of the proposed Hillcrest Station Specific Plan on biological resources would be less than significant.

Mitigation Measures

No mitigation measures are required.

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3.4 Circulation and Traffic

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Regional and Local Road Network

The Planning Area is a 375-acre rectangular area in northeast Antioch that is bounded on the north generally by Oakley Road, on the east by State Route 160 (SR 160), on the south by State Route 4 (SR 4), and on the west by Hillcrest Avenue. A larger study area has been defined to evaluate circulation impacts. Figure 3.4-1 shows the area context.

Major roads in the study area include SR 4 and SR 160 which are state highways as well as Hillcrest Avenue and East 18th Street. Local roads serving the site include Oakley Road, Phillips Lane, Willow Avenue, and Viera Avenue. Each of these roadways is described below.

SR 160 is a north-south highway that extends through the study area, east of the Planning Area. This roadway serves as a major route connecting Antioch and Oakley to the Antioch Bridge and Sacramento County to the north, and to the SR 4 freeway to the west and east. SR 160 typically has two lanes in each direction, narrowing to one lane per direction north of the Antioch Bridge toll plaza. SR 160 has a local interchange at East 18th Street just north and east of the Planning Area and it is designated as a Route of Regional Significance through the study area by the *Draft 2008 East County Action Plan*.

SR 4 is an east-west highway that extends through the study area, south of the Planning Area. The road serves as a major route beginning in Hercules at Interstate 80 and continuing east through Antioch and eventually to Stockton and San Joaquin County. Through the study area, SR 4 is a four lane highway with a local interchange at Hillcrest Avenue. SR 4 is a designated Route of Regional Significance through the study area.

Hillcrest Avenue is a two- to six-lane, north-south roadway located west of the Planning Area. The road provides direct access to SR 4 via signalized intersections at the Hillcrest Avenue interchange. South of SR 4 the corridor is mostly commercial while north of SR 4 the corridor transitions to residential uses. Hillcrest Avenue is designated as a Route of Regional Significance through the study area.

East 18th Street is an east-west two- to four-lane roadway in Antioch and is located north of SR 4. It runs parallel to the SR 4 corridor. Direct access to SR 160 is via signalized intersections adjacent to the boundary between Antioch and Oakley. East of the interchange within the City of Oakley the street name changes to Main Street. This corridor is designated a Route of Regional Significance in the *2008 East County Action Plan*.

Oakley Road is a two-lane east-west roadway that connects Oakley to Antioch via a two-lane bridge over SR 160. Oakley Road begins at Viera Avenue in Antioch, extending over SR 160 and through the City of Oakley to Empire Avenue. There is limited development along Oakley Road within the study area.

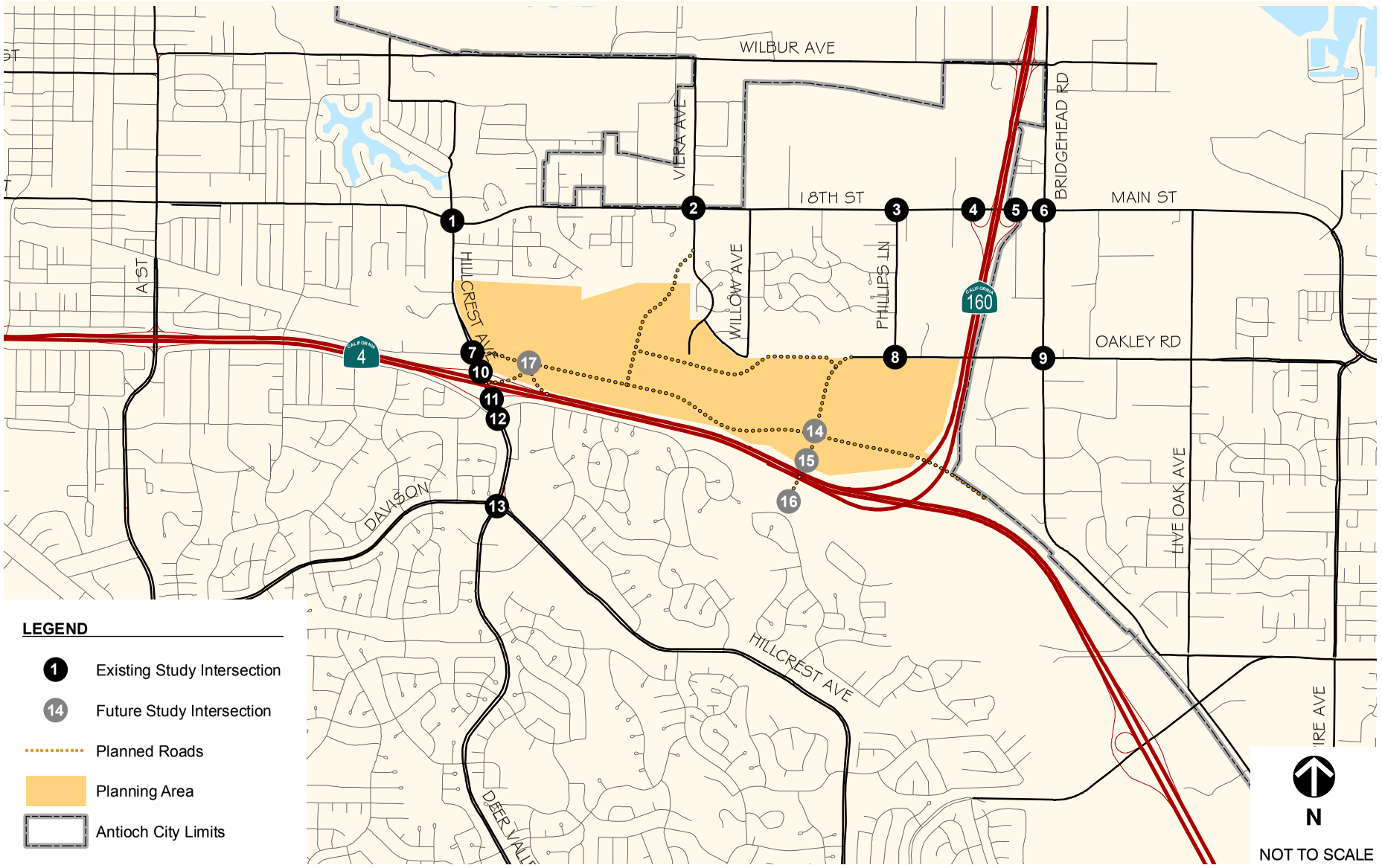

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Figure 3.4-1: Area Context & Study Intersections

Source: Fehr & Peer, 2008.

Phillips Lane is a two-lane north-south roadway that connects Oakley Road to East 18th Street. There is limited development along the corridor, although it does provide access to local residential streets.

Willow Avenue is a two-lane north-south roadway that connects Oakley Road to East 18th Street. There is residential development along the corridor with driveway access directly to Willow Avenue.

Viera Avenue is a two-lane north-south roadway that extends from the study area, south of Oakley Road, north to Wilbur Avenue. It intersects East 18th Street at a signalized intersection. There is residential development along the corridor with driveway access directly to Viera Avenue.

Traffic conditions on streets in Antioch are affected more by the operations at the intersections than by the capacities of the local streets because traffic control devices (signals and stop signs) control the capacity of the street segments. Traffic conditions on the freeway are affected by a combination of factors including the traffic densities and the number and type of merging, diverging, and weaving maneuvers. Intersection and freeway operations are measured using a grading system called level of service (LOS) ranging from LOS A, indicating free flow traffic conditions with little or no delay experienced by motorists, to LOS F, which describes congested conditions where traffic flows exceed design capacity, resulting in long queues and delays.

Level of Service Methodologies

Study intersection operations were evaluated using level of service calculations. The analysis method outlined in *Technical Procedures Update* prepared by the Contra Costa Transportation Authority (CCTA) (July, 2006), known as CCTALOS, was utilized. To augment this analysis, the Transportation Research Board's 2000 *Highway Capacity Manual* (HCM) method and Synchro software were also used.

Freeway operations were evaluated using the Delay Index method prescribed in *Technical Procedures Update* prepared by the Contra Costa Transportation Authority (CCTA) (July, 2006). The FREQ software was used to calculate freeway speeds.

Signalized Intersections

At each signalized study intersection, traffic conditions were evaluated using the CCTALOS and HCM methods. The CCTALOS planning-level analysis uses various intersection characteristics (i.e., traffic volumes, lane geometry, and signal phasing) to estimate the volume-to-capacity (v/c) ratio of an intersection. By contrast, the HCM operations analysis uses those and other intersection characteristics (i.e., traffic volumes, lane geometry, signal timing, and pedestrian activity) to estimate the average delay (measured in seconds per vehicle) experienced by motorists traveling through an intersection. Table 3.4-1 summarizes the relationship between the v/c ratio, delay, and LOS for signalized intersections. It is typical that both methods be applied so that both the intersection capacity and the average delay can be reported and evaluated.

Table 3.4-1 Signalized Intersection LOS Criteria

LOS	*CCTALOS*	*HCM*	*Description*
	Sum of Critical V/C Ratio	*Average Control Delay per Vehicle (seconds)*	
A	< 0.60	≤ 10.0	This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	0.61 - 0.70	10.1 to 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	0.71 - 0.80	20.1 to 35.0	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.
D	0.81 - 0.90	35.1 to 55.0	At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	0.91 - 1.00	55.1 to 80.0	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. The individual cycle failures are frequent occurrences.
F	> 1.00	> 80.0	This level, considered unacceptable, occurs when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be contributing factors to high delay levels.

Source: Technical Procedures, Contra Costa Transportation Authority, 2006.
Highway Capacity Manual, Transportation Research Board, 2000.

Unsignalized Intersections

For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, Chapter 17 of the Transportation Research Board's 2000 HCM method was used. With this method, the LOS ranking is related to the total average delay for each intersection movement, including those not controlled by a stop sign. Total delay is defined as the amount of time required for a driver to stop at the back of the queue, move to the first-in-queue position, and depart from the queue into the intersection. Table 3.4-2 summarizes the relationship between delay and LOS for unsignalized intersections. Typically, the delay and LOS for the worst-movement from the side-street is also reported for side-street stop-controlled intersections. Synchro software was used to calculate HCM-based LOS for unsignalized intersections.

Table 3.4-2 Unsignalized Intersection LOS Criteria

Level of Service	*Description*	*Average Control Delay Per Vehicle (Seconds)*
A	Little or no delays	< 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: Highway Capacity Manual, Transportation Research Board, 2000.

Freeway Delay Index

Traffic conditions on the freeway were evaluated using the Delay Index method. The Delay Index is defined as the ratio of the peak hour congested travel time to free-flow travel time. For example, a Delay Index of 2.0 means that it takes twice as long to travel a particular corridor during the peak commute hour than during non-commute hours when traffic moves at free-flow speeds. The FREQ software was used to determine the corridor travel speeds, which were then used to calculate the Delay Index.

Existing Vehicle Traffic Conditions - Intersections

The study intersections are listed below and geographically shown on Figure 3.4-1. The existing (2007) weekday intersection traffic counts for the AM and PM peak hours are shown on Figure 3.4-2.

1. Hillcrest Avenue at East 18th Street
2. Viera Avenue at East 18th Street
3. Phillips Lane at East 18th Street
4. SR 160 Southbound Ramps at East 18th Street
5. SR 160 Northbound Ramps at East 18th Street
6. Bridgehead Road / Neroly Road at Main Street
7. Hillcrest Avenue at Sunset Drive
8. Phillips Lane at Oakley Road
9. Neroly Road at Oakley Road
10. Hillcrest Avenue at SR 4 Westbound Ramps
11. Hillcrest Avenue at SR 4 Eastbound Ramps
12. Hillcrest Avenue at East Tregallas Road and Larkspur Drive
13. Hillcrest Avenue at Deer Valley Road and Davidson Drive

The AM and PM peak hours were derived from peak period intersection counts collected during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM). The data was collected during typical weekdays (Tuesday through Thursday) in September/October 2007 while schools were in session. The count data indicates that the AM peak hour occurs from 7:30 AM to 8:30 AM and the PM peak hour occurs from 4:30 PM to 5:30 PM. The existing AM and PM peak-hour intersection results using both CCTALOS and HCM are summarized in Table 3.4-3. The HCM LOS results are also shown on Figure 3.4-3.

All signalized study intersections operate at acceptable levels of service based on the CCTALOS and HCM methods and LOS standards, with the exception of the SR 160 Northbound Ramps at East 18th street (#5), Bridgehead Road/ Neroly Road intersection with Main Street (#6), and Hillcrest Avenue at SR 4 Eastbound Ramps (#11) which operate at LOS E in the weekday PM peak hour.

Most unsignalized intersections operate at an acceptable level of service during both the AM and PM peak hours, with the exception of the Neroly Road / Oakley Road intersection (#13) which operates at LOS F during the AM and PM peak hours. This intersection is an all-way stop-controlled intersection that the City of Oakley intends to signalize. The unacceptable service level is caused by heavy traffic volumes on Neroly Road.

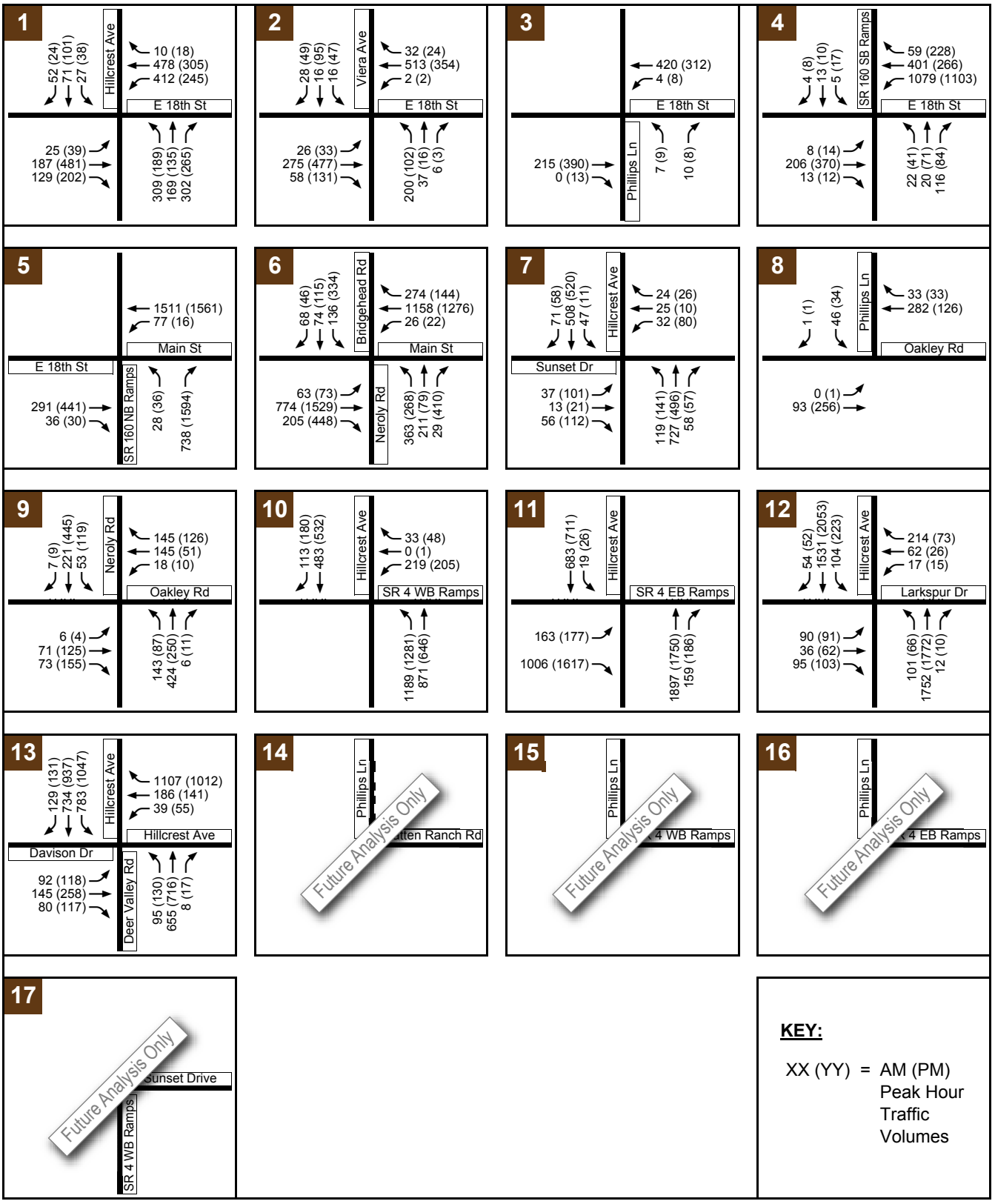

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Figure 3.4-2: Existing (2007) Peak Hour Traffic Volumes

Source: Fehr & Peer, 2008.

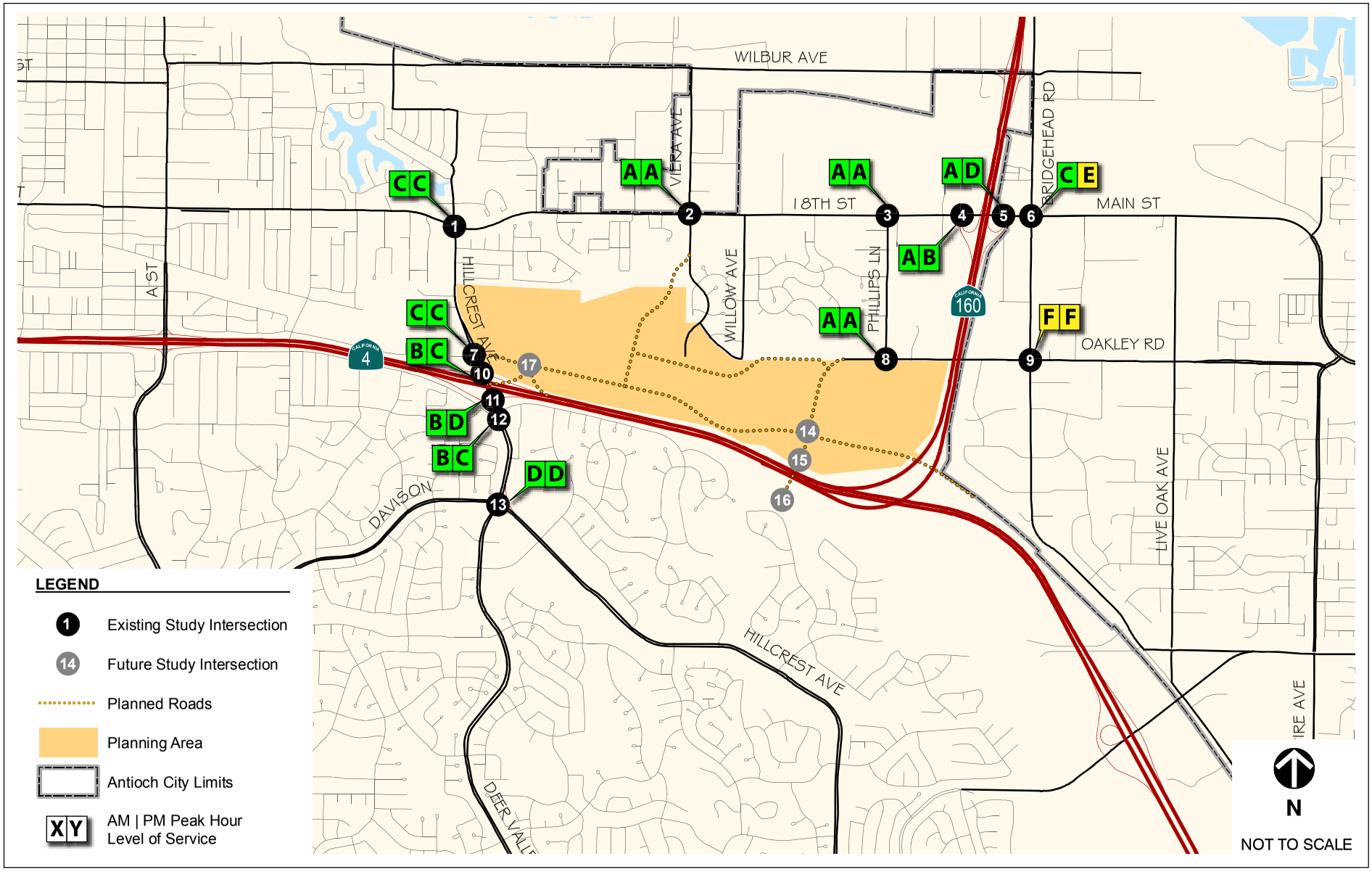

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Figure 3.4-3: Existing Intersection Levels of Service

Source: Fehr & Peer, 2008.

The CCTALOS method can produce different results than the HCM method. The primary reason that the methods produce different results is that the CCTALOS method analyzes each intersection independently as an isolated intersection and calculates level of service based on the theoretical capacity of each movement at the intersection. Level of service in the HCM method is based on the delay experienced by each vehicle. The HCM method calculates delay based on physical characteristics of the intersection including signal timing and phasing at the intersection.

Table 3.4-3 Existing (2007) Intersection Operations Weekday AM and PM Peak Hour

Intersection	*Control /1/*	*Peak Hour*	*CCTALOS*		*HCM*	
			V/C /2/	*LOS*	*Delay /3/*	*LOS*
1. Hillcrest Avenue at East 18th Street	Signal	AM PM	0.576 0.531	A A	29 29	C C
2. Viera Avenue at East 18th Street	Signal	AM PM	0.310 0.296	A A	13 7	A A
3. Phillips Lane at East 18th Street	SSSC	AM PM	-- --	-- --	1 1	A A
4. SR 160 Southbound Ramps at East 18th Street	Signal	AM PM	0.491 0.564	A B	11 15	A B
5. SR 160 Northbound Ramps at East 18th Street	Signal	AM PM	0.651 **0.958**	B **E**	13 40	A D
6. Bridgehead Road/Neroly Road at Main Street	Signal	AM PM	0.602 **0.925**	B **E**	30 **64**	C **E**
7. Hillcrest Avenue at Sunset Drive	Signal	AM PM	0.338 0.390	A A	23 30	C C
8. Phillips Lane at Oakley Road	SSSC	AM PM	-- --	-- --	1 1	A A
9. Neroly Road at Oakley Road	AWSC	AM PM	-- --	-- --	**53** **53**	**F** **F**
10. Hillcrest Avenue at SR 4 Westbound Ramps	Signal	AM PM	0.681 0.736	B C	19 22	B C
11. Hillcrest Avenue at SR 4 Eastbound Ramps	Signal	AM PM	0.731 **0.907**	C **E**	18 37	B D
12. Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue	Signal	AM PM	0.562 0.604	A B	19 21	B C
13. Hillcrest Avenue at Deer Valley Road/Davidson Drive	Signal	AM PM	0.743 0.788	C C	41 52	D D

Bold indicates intersection operating at deficient level of service, based on LOS standards described in the following section on Regulatory Setting and shown on Table 3.4-6.

/1/ Intersection Control: Signal = Signalized intersection; SSSC = Side-street stop-controlled intersection; and AWSC = All-way stop-controlled intersection.

/2/ Volume-to-capacity ratio (V/C) determined for all signalized intersections using the CCTALOS methodology. Unsignalized intersections are not evaluated with this method.

/3/ Average intersection delay is calculated for all signalized and unsignalized intersections using the HCM methods. For side-street stop-controlled intersections, average intersection delay (in seconds per vehicle) is presented and the delay for worst approach is shown in parentheses.

Source: Fehr & Peers, 2008.

Existing Vehicle Traffic Operations - Freeway

Weekday peak period traffic counts were conducted on SR 4 at the Hillcrest Avenue over-crossing and at study area ramps during a typical weekday (Tuesday through Thursday) in October 2007. No major incidents were reported on SR 4 or SR 160 during the data collection period. The mainline counts collected in October 2007 were lower than weekday peak period volumes on SR 4 and SR 160 obtained from the 2006 traffic volume data provided by Caltrans at the SR 160 count station located north of Wilbur Avenue. Therefore, the 2006 traffic volume data provided by Caltrans was used for this study. Table 3.4-4 summarizes the existing AM and PM peak hour freeway traffic volumes.

Table 3.4-4 Existing (2006) Freeway Traffic Volumes

Freeway Segment	*Eastbound AM Peak Hour*	*Westbound AM Peak Hour*	*Eastbound PM Peak Hour*	*Westbound PM Peak Hour*
SR 4, West of Hillcrest Avenue	2,040	2,390	3,720	2,880
SR 4, East of Hillcrest Avenue	1,050	1,340	2,140	1,670
SR 4 (Bypass, west of SR 160)	Data Unavailable - Opened summer 2008			
SR 160, South of E. 18th St	1,050	1,340	2,140	1,670

Source: Fehr & Peers, 2008.

Truck traffic on SR 4 and SR 160 was obtained from the 2005 Annual Average Daily Truck Traffic on the California State Highway System prepared by Caltrans. These counts indicate that heavy vehicles make up about five percent of the total traffic on SR 4 and SR 160.

The existing AM and PM peak-hour speed and Delay Index is summarized in Table 3.4-5. SR 4 and SR 160 in the study area currently satisfy the Traffic Service Objective set by the *East County Action Plan* (CCTA 2000), which specifies that the Delay Index on the freeway should be no greater than 2.5.

Table 3.4-5 Existing Freeway Operations

Measure of Effectiveness /1/	*Eastbound AM Peak Hour*	*Westbound AM Peak Hour*	*Eastbound PM Peak Hour*	*Westbound PM Peak Hour*
Average Travel Speed (mph)	70	46	68	70
Delay Index /2/	1.0	1.52	1.02	1.0

/1/ Study section of SR 4/SR 160 extends from A Street (east side ramps) to Wilbur Avenue (south side ramps).

/2/ Delay Index is calculated as the free-flow speed (assumed to be 70 mph) divided by the average travel speed. The Traffic Service Objective set by the *East County Action Plan* (CCTA 2000) specifies that the Delay Index on the freeway should be no greater than 2.5.

Source: Fehr & Peers, 2008.

Existing Vehicle Miles Traveled (VMT)

Vehicle miles traveled (VMT) refers to the number of vehicle miles traveled during a given period of time for a given population. One vehicle traveling one mile constitutes one vehicle mile, regardless of its size or the number of passengers. VMT is a common measure of roadway use. The VMT per capita is the total VMT generated by the given population divided by the population. It is a measure of the vehicle miles each person travels on average. Per capita VMT data correlate with various economic and lifestyle factors such as auto ownership, workforce diversity, teen driving, and land use patterns. For this study, population refers to population plus employment.

The Contra Costa Transportation Authority (CCTA) Decennial Countywide Travel Demand Model was used to derive citywide VMT characteristics for year 2007. The land use inputs to the model for year 2007 included 33,822 dwelling units (104,150 population) and 22,178 jobs in Antioch. In total, this land use generated 2,583,803 VMT, or 20.5 VMT per capita i.e., population plus employment.

Existing Transit Operations and Facilities

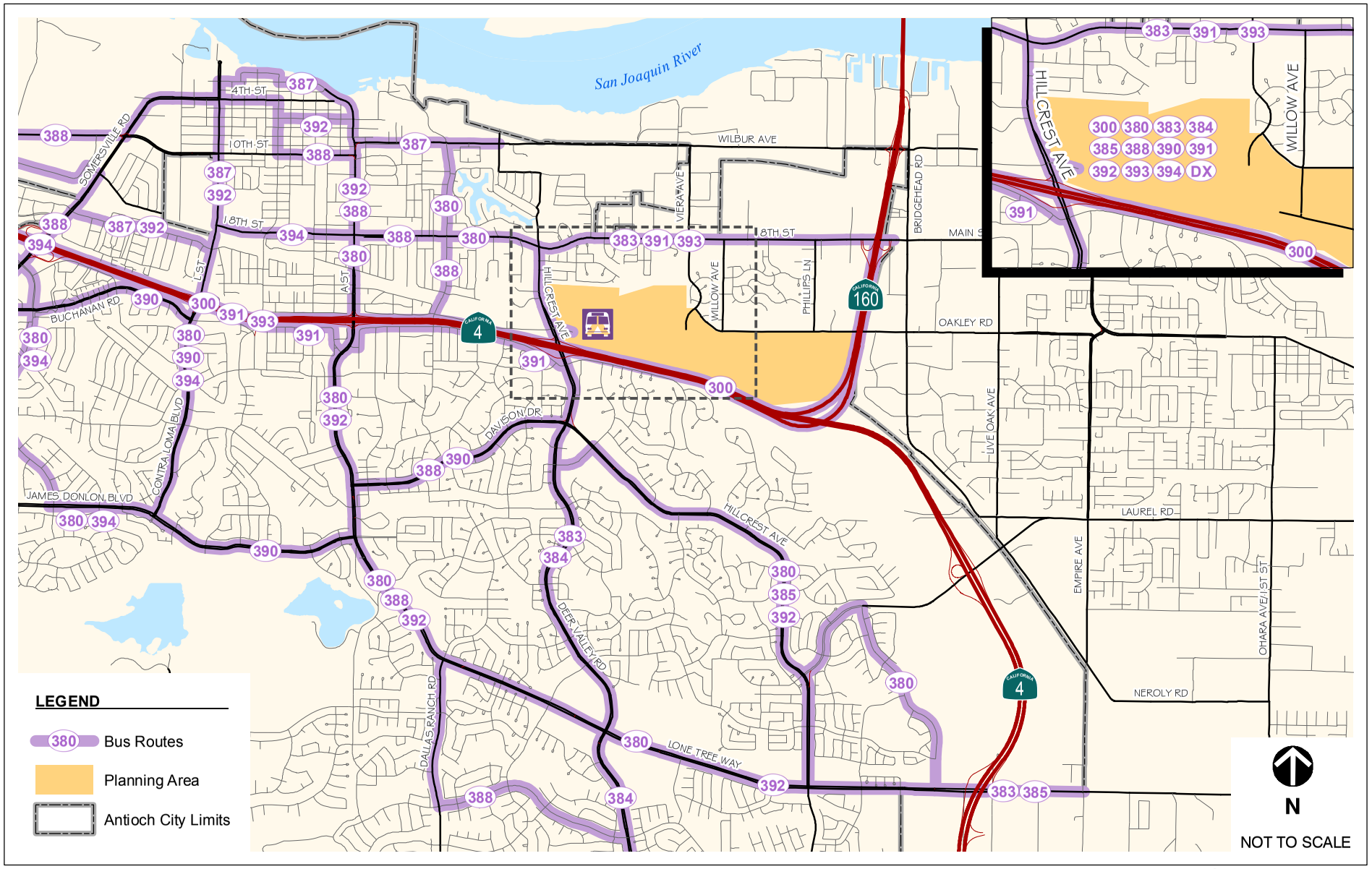
Transit is an important part of Antioch's transportation planning efforts. Expansion of bus service and extension of rail transit into the community will assist in easing the burden on SR 4 during peak commute hours. Bus and rail transit service will also improve access to Antioch's employment generating areas, and provide mobility to transit-dependent populations (e.g., youth and senior citizens). (Antioch General Plan pg. 7-15)

There are several bus transit routes that serve the Hillcrest Park & Ride lot. Figure 3.4-4 shows the existing transit routes operated by Tri Delta Transit that access the lot. These include Routes 300, 383, 384, 385, 386, 390, 392, 393 (weekend), and 394 (weekend). These routes operate with 15 to 60 minute headways throughout the day. Tri Delta Transit also operates the Delta Express which stops at the lot. Transfers to County Connection's Route 930C, which services Pittsburg, Concord, Walnut Creek and the Walnut Creek BART station are possible at the Hillcrest Park & Ride lot.

During peak times about nine westbound or eastbound Tri Delta Transit buses serve the Hillcrest Park & Ride lot and the Pittsburg/Bay Point BART station. Between six and seven buses serve the Sutter Delta Medical Center in Antioch during the same periods.

Tri Delta Transit's Route 300 provides express bus service between Brentwood and the Pittsburg/Bay Point BART Station. This all-day express service makes two stops in Brentwood, two in Oakley, one in Antioch at the Hillcrest Park & Ride lot, and one at the Pittsburg/Bay Point BART Station. The bus operates from 3:15 AM to approximately 10:00 PM on 15- to 30-minute headways.

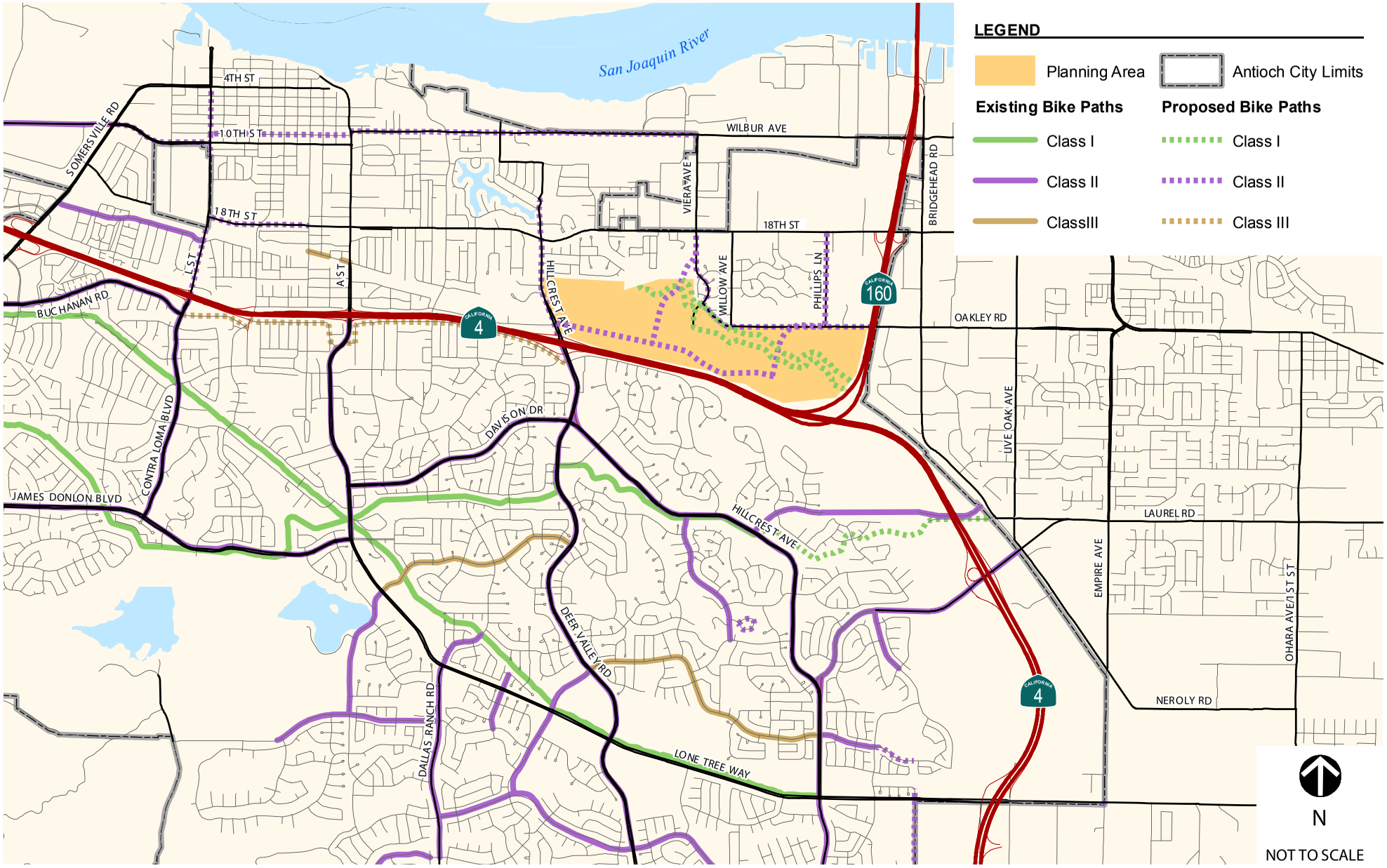
Delta Express, the express commuter bus run by Tri-Delta Transit, serves Martinez from the Hillcrest Park & Ride lot with one bus in the morning and one in the evening. Another express route connects the lot with the Dublin/Pleasanton BART station, where passengers can connect with a free shuttle to the Bishop Ranch Business Park. Two bus runs each commute period are made for this route. The third route is between the lot and the Lawrence Livermore National Lab. It too has two morning and two evening runs during the week.



Hillcrest Station Area Specifc Plan

Figure 3.4-4: Existing (2007) Transit Routes in Antioch

Source: Fehr & Peer, 2008.



Hillcrest Station Area Specifc Plan

Figure 3.4-5: Existing and Planned Bike Routes in Antioch

Source: Fehr & Peer, 2008.

Existing Bicycle and Pedestrian Facilities

The City of Antioch prioritizes the maintenance of a safe, convenient, and continuous network of pedestrian sidewalks, pathways, and bicycle facilities to facilitate bicycling and walking as alternatives to driving private automobiles. (General Plan pg. 7-14)

Existing and proposed bikeway facilities in Antioch are distributed throughout the city. The City uses the following standard bike lane classification system: Class I facilities are bike paths that exclude motor vehicle access; Class II facilities are designated bike lanes that provide a space in the road for bicycle travel; and Class III facilities are bicycle routes that provide signage to alert bicyclists and motorists that a bicycle route exists.

Currently, limited bicycle and pedestrian facilities exist within the study area. Hillcrest Avenue, south of East 18th Street, is designated for Class II bike facilities. No other roads in the Planning Area have designated bike facilities. Pedestrian access is available throughout the developed areas of Antioch, including sidewalks, wheelchair ramps, and crosswalks. Many outlying areas are still rural in character, and do not have sidewalks. There are no continuous pedestrian facilities within the Planning Area since the area is generally undeveloped.

Pedestrian and bicycle facilities will be provided in accordance with the General Plan as future development proceeds. The City of Oakley General Plan (adopted in December 2002), the City of Antioch General Plan (November 2003), City of Oakley Parks, Recreation and Trails Master Plan (March 2003), and East County Bikeway Plan (currently being updated) propose that several new facilities be constructed in the future. Figure 3.4-5 shows the existing and future bike facilities in the city, as planned in the 2003 General Plan.

Existing Freight Rail

The Union Pacific Mococo Line traverses the Planning Area. At this time, the rail line is generally inactive. There are currently at-grade crossings of this rail line at Hillcrest Avenue, west of the Planning Area, and at Willow Avenue within the Planning Area. There are no grade-separated rail crossings in northeast Antioch. So, any train activity on this line would prohibit north/south vehicle flow.

The General Plan identifies the need for an additional rail crossing via Phillips Lane extension south from Oakley Road to Slatten Ranch Road. Because California Public Utilities Commission (CPUC) guidelines generally prohibit the creation of new at-grade rail crossings, providing this crossing will necessitate construction of a new over- or under-pass. A similar condition exists should Viera Avenue be extended south to Slatten Ranch Road.

The General Plan recognizes that traffic congestion at local at-grade rail crossings will increase due to increased rail and automobile traffic. As a result, the General Plan policies require the City to work with the railroads to construct grade separations along the tracks through Antioch including at Hillcrest Avenue.

REGULATORY SETTING

State

Caltrans does not have regulations regarding traffic LOS on state highway facilities. They do have guidelines for traffic operations on State Highway facilities. Caltrans recommends a target LOS at the threshold between LOS C and LOS D. If the location under existing conditions operates worse than the appropriate target LOS, then the existing LOS should be maintained.

Regional

One of the key components in the Contra Costa Transportation Authority's Growth Management Program is the requirement that local jurisdictions engage in cooperative, multi-jurisdictional planning. One of the key components of this cooperative planning is the preparation of Action Plans for Routes of Regional Significance. The Action Plans are intended to reduce cumulative regional traffic impacts from forecasted development. As part of the Action Plan, each Regional Transportation Planning Committee identifies a system of Regional Routes, that is, those freeways and arterials that provide the main connections among Contra Costa's communities and to the surrounding region.

The *East County Action Plan* (CCTA, 2000) establishes Traffic Service Objectives (TSO) for routes of regional significance in eastern Contra Costa County. An update to the East County Action Plan is currently in draft form but has not yet been adopted; the TSOs proposed in that draft are the same as those in the adopted 2000 East County Action Plan for the facilities studied in this report. The TSO used to measure freeway operations is the peak hour Delay Index. Delay Index is defined as the ratio of the peak hour congested travel time to free-flow travel time on each freeway segment. For example, a Delay Index of 2.0 means that it takes twice as long to travel a particular segment during the peak commute hour than during non-commute hours when traffic moves at free-flow speeds. Objectives for SR 4 and SR 160 include a Delay Index of 2.5.

The Action Plan establishes a TSO for signalized intersections on Routes of Regional Significance. LOS of Mid-D with a volume-to-capacity ratio of 0.85 is considered the threshold.

Local

The Growth Management Element of the City's General Plan sets level of service standards for roadways in the City of Antioch consistent with requirements of Measure C, along with policies to ensure that these standards are maintained. Standards are defined for "Routes of Regional Significance" and for "Basic Routes."

"Routes of Regional Significance" include state highways and other major roadways that carry a significant amount of through traffic and link Antioch to neighboring jurisdictions. These routes are subject to implementation of the Action Plans, a set of programs and policies that are developed with other jurisdictions in the County to address traffic impacts along these regional routes. SR 4, SR 160, Hillcrest Avenue, and East 18th Street are designated as routes of regional significance. Discretionary projects that impact routes of regional significance shall comply with the requirements of the adopted Action Plans.

"Basic Routes" include all local roads that are not otherwise designated as routes of regional significance. Roads providing access the Planning Area that are considered "Basic Routes" include Neroly Road, Oakley Road, Willow Avenue, and Viera Avenue.

Table 3.4-6 identifies the intersection standards for the study locations using the City's General Plan standards and the standards from the East County Action Plan (CCTA, 2000). Consistent with City General Plan policies, the adopted standards from the East County Action Plan (CCTA, 2000) will be used in this study to assess CEQA-level impacts.

Table 3.4-6 Intersection Traffic Standards

Study Intersection	*Antioch General Plan Standards*	*East County Action Plan Standards /1/*
Signalized intersections along Hillcrest Avenue at: Deer Valley Road / Davidson Drive (#1) East Tregallas Road / Larkspur Drive (#2) SR 4 Eastbound Ramps (#3) SR 4 Westbound Ramps (#4) Sunset Drive (#5)	LOS D Avg. Delay = 55 sec. V/C = 0.90	Mid-LOS D Avg. Delay = 45 sec. V/C = 0.85
Signalized intersections on Basic Routes in Antioch, within 1,000 feet of a freeway interchange: SR 160 Southbound Ramps at East 18th Street (#9) SR 160 Northbound Ramps at East 18th Street (#10)	Mid-LOS E Avg. Delay = 67 sec. V/C = 0.94	Mid-LOS D Avg. Delay = 45 sec. V/C = 0.85
Signalized intersections on Basic Routes in Antioch, further than 1,000 feet of a freeway interchange: Hillcrest Avenue at East 18th Street (#6) Viera Avenue at East 18th Street (#7)	High-LOS D Avg. Delay = 50 sec. V/C = 0.85-0.89	Mid-LOS D Avg. Delay = 45 sec. V/C = 0.85
Unsignalized intersections on Basic Routes in Antioch, further than 1,000 feet of a freeway interchange: Phillips Lane at East 18th Street (#8) Phillips Lane at Oakley Road (#12)	High-LOS D **/2/** Avg. Delay = 32 sec	Mid-LOS D **/2/** Avg. Delay = 30 sec
Signalized intersections along Main Street: Bridgehead Road / Neroly Road at Main Street (#11)	LOS D Avg. Delay = 55 sec. V/C = 0.90	Mid-LOS D Avg. Delay = 45 sec. V/C = 0.85
Unsignalized intersections on Basic Routes in Oakley: Oakley Road/Neroly Road (#13)	LOS D **/2/** Avg. Delay = 35 sec.	Mid-LOS D **/2/** Avg. Delay = 30 sec

/1/ East County Action Plan for Routes of Regional Significance (TRANSPLAN, 2000). These standards will be used to assess CEQA-level impacts.

/2/ Unsignalized intersections are not explicitly addressed. This threshold is extrapolated from the signalized standards.

Source: Fehr & Peers, 2008

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Based on the adopted standards in the East County Action Plan and consistent with City General Plan policies, a significant traffic impact would occur if the addition of project-related traffic would result in:

- operations of a signalized study intersection to decline from an acceptable level to an unacceptable level (service levels are defined in Table 3.4-6 for each study intersection); or,
- deterioration in already unacceptable operations at a signalized intersection by a change in average delay of more than 5 seconds; or,
- operations of an unsignalized study intersection to decline from an acceptable to an unacceptable level (as defined in Table 3.4-6), and the need for installation of a traffic signal, based on the Manual on Uniform Traffic Control Devices (MUTCD) Peak Hour Signal Warrant (Warrant 3); or,
- operations of a freeway segment to exceed the established Delay Index standard of 2.5; or,
- deterioration in a freeway segment that already exceeds the established Delay Index standard by increasing the freeway volume by more than 3 percent.

A significant traffic impact would also occur if the project would result in:

- substantially increased hazards or congestion due to a design feature (e.g., sharp curves) or incompatible uses (e.g., farm equipment); or,
- inadequate emergency access; or,
- conflicts with adopted alternative transportation policies, plans, or programs.

SUMMARY OF IMPACTS

Intersection Operations

With the Circulation Plan and policies contained in the Hillcrest Station Area Specific Plan, all street intersections will meet the adopted Level of Service (LOS) standards with two exceptions. Traffic at two intersections cannot be mitigated to less than significant levels:

- In 2035, the Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue intersection would operate at LOS F during the AM and PM peak hours. There will be insufficient capacity during the AM peak hour to accommodate northbound travel on Hillcrest Avenue through the Larkspur Avenue signalized intersection. This congestion will remain isolated to Hillcrest Avenue, south of the Larkspur Avenue intersection.
- In 2035, Hillcrest Avenue at SR 4 Eastbound Ramp intersection would operate at LOS F during the PM peak hour. The PM peak hour traffic congestion will be isolated to the right turning traffic from the Eastbound SR 4 Off-Ramp onto Hillcrest Avenue (southbound). This congestion occurs because there is less than 200 feet separating the off-ramp intersection with the adjacent Larkspur Avenue intersection.

Freeway Operations

Freeway segments with a Delay Index greater than 2.5 are considered to operate below acceptable thresholds per the *East County Action* Plan (CCTA, 2000). All freeway study segments currently (2006) operate with an acceptable Delay Index. In 2035, all freeway study segments will operate with an acceptable Delay Index under the assumption that the Phillips Lane interchange is constructed.

However, since the Phillips Lane interchange is not currently approved or funded, its construction cannot be guaranteed, and therefore a significant and unavoidable freeway impact has been identified. Analysis indicates that the Hillcrest Interchange of SR 4 will experience severe congestion by 2035 if the Phillips Lane Interchange is not constructed. Even without any development in the Hillcrest Station Area, freeway traffic will experience delay indexes of up to 3.3, traveling at 21 miles per hour average speed. The addition of development in the Hillcrest Station Area would exacerbate this congestion even further.

Qualitative analysis and preliminary traffic model runs were conducted to determine when freeway operations will begin to exceed the adopted Delay Index standard, assuming that Phillips Lane Interchange is not built, and there is a phased gradual development of the Hillcrest Station Area plus an eBART station. The analysis indicates that under that scenario the Freeway Delay Index will begin to be exceeded by the year 2020. This is projected to occur even with the installation of the Hillcrest Interchange Improvements planned by CCTA, and the extension of Slatten Ranch Road to Laurel Road. Without those planned improvements that reduce traffic at the Hillcrest Interchange, freeway operations would begin to operate below the acceptable Delay Index sometime between 2015 and 2020, primarily due to traffic accessing the eBART station via the SR 4 freeway.

Vehicle Miles Traveled

Implementation of the proposed Specific Plan will have a beneficial effect on Antioch-generated VMT. The plan would support a mixed-use environment near eBART and Tri Delta Transit bus service. Because of this proximity, employees and residents will have more opportunity to use transit. In addition, the Planning Area will contain a mix of commercial retail and services which will reduce the number of trips residents and employees need to make by personal vehicle. Trip-chaining, increased opportunities for walking and bicycling, and access to transit all help to reduce daily VMT per capita. As a result, the plan would generate about 7 percent less VMT per capita than the citywide average in year 2035.

Transit

Implementation of the proposed Specific Plan will have a beneficial impact on local transit use. The large, mixed-use environment adjacent to the eBART station would encourage regional transit use via the BART system, and local transit use via Tri-Delta Transit, which currently operates nine bus routes and express bus service to the Planning Area.

Parking

Implementation of the proposed Specific Plan will provide additional parking in the Specific Plan area to serve the land uses proposed. Parking supplies are proposed to meet the local zoning code requirements, with some reductions allowed for shared parking and for projects within walking distance of the eBART station.

Pedestrian and Bicycle Circulation and Access

Implementation of the proposed Specific Plan will have a beneficial impact on pedestrian and bicycle circulation and access. The large, mixed-use environment proposed in the Specific Plan would encourage bicycle and pedestrian access by placing complementary uses (housing, shopping, professional offices, transit facilities) within walking or bicycling distance of each other, and by providing a relatively fine-grained system of local streets and access ways. In addition, it has been shown that higher-density residential and commercial uses generate proportionally higher rates of pedestrian and bicycling activity than typical low-density suburban development patterns, and proximity to a major regional transit stop also encourages more cycling and walking. This is a beneficial effect of the proposed project.

Freight Rail

Full implementation of the proposed Specific Plan requires a new grade separation at Hillcrest Avenue and the Union Pacific Railroad, to accommodate increased train operations projected by Union Pacific Railroad. Without a grade separation, there will be significant impacts on Hillcrest Avenue and SR 4. Because the extent of increased train traffic is not known with certainty, and since the grade separation is not an identified or funded project in the Regional Transportation Plan, this impact is classified as significant and unavoidable. The impacts on the Hillcrest Interchange and SR 4 can be partially off-set by constructing the new Phillips Lane Interchange with a grade separation at Phillips Lane and the Union Pacific Railroad. This would provide an alternative north/south connection between SR 4 and northeast Antioch when freight trains travel through the area.

Emergency Access

Implementation of the proposed Specific Plan will have a beneficial impact on emergency access. By including extensions of roadways that currently terminate and providing a relatively fine-grained system of local streets and access ways, the proposed plan will allow more opportunities and route choices for emergency service providers. The new Phillips Lane Interchange proposed in the plan would provide more regional route choice for emergency service providers in the event of an evacuation or other major emergency. This is a beneficial effect of the proposed project.

Consistency with Adopted Plans

The proposed Specific Plan is generally consistent with adopted regional plans. Amendments to the Antioch General Plan are part of this project, and thus there are no inconsistencies with the Antioch General Plan.

Hazardous Design Features

Implementation of the proposed Specific Plan will not have an effect on hazardous design features, and therefore this topic is not evaluated in the EIR. The transportation system proposed with the plan would be designed to meet applicable local, regional, and state standards and would be reviewed by the City for consistency with those standards prior to granting design approval.

METHODOLOGY AND ASSUMPTIONS

A detailed description of the traffic forecasting process is described in the memorandum *Model Validation and Year 2007 and 2035 Forecasts* (Fehr & Peers, 2008). The content of the memorandum is summarized in the following paragraphs.

Considering the major changes in the regional roadway network and the amount of regional growth expected in the future, the Contra Costa Transportation Authority (CCTA) Decennial Countywide Travel Demand Model was selected as the most appropriate tool to forecast 2035 AM and PM peak hour intersection volumes. The Decennial Countywide Travel Demand Model (Countywide Model) as produced by CCTA is available in scenarios that represent years 2000, 2010, 2020, and 2030. Thus, scenarios for years 2007 and 2035 were developed for this analysis.

The year 2035 model scenario was developed to represent traffic conditions at station area buildout and to reflect ABAG's *Projections 2007* land use forecasts which extend out to 2035.

Traffic Model Calibration and Validation Methodology

The Countywide Model was modified to develop a year 2007 scenario to better reflect current conditions in the area and to establish the baseline conditions for future analysis. The area for calibration was defined to include the cities of Antioch, Brentwood, and Oakley, to reflect the potential regional effects of the SR 4 Bypass.

As required by CCTA's Technical Procedures, a sub-area model validation exercise was conducted using validation targets specified by CCTA. The 2007 AM and PM peak hour volumes produced by the model were compared with traffic counts collected in the area in 2006 and 2007. Preliminary model validation results were used to guide further adjustments to the model input parameters, such as roadway types and speeds, to better reflect actual conditions.

The model revisions substantially increased the number of count locations that meet the validation targets, although both the original and the revised 2007 AM peak hour models leave two of the six CCTA peak hour validation criteria not satisfied. These two criteria are the tests related to arterial roadways. However, the revisions bring the model significantly closer to passing both criteria. The model revisions applied to the 2007 PM peak hour model result in substantial improvements in the number of count locations meeting the validation targets, and in fact the revised model satisfies all of the CCTA peak hour validation criteria.

Traffic Modeling Methodology

The 2007 CCTA Model and 2035 CCTA Model (both developed as part of the calibration and validation process) were used to develop peak hour demand traffic forecasts. The following four-step process was used to determine Year 2035 AM and PM peak hour turning movement forecasts for the intersections including ramp forecasts:

- **Step 1** - The 2007 CCTA Model was executed to determine the base year model peak hour demand volumes for the intersections.
- **Step 2** - The 2035 CCTA Model was executed to determine the "raw" (i.e., unadjusted) peak hour demand forecasts for the intersections.

- **Step 3** – The raw peak hour demand forecasts were adjusted using the "furness" method presented in the *CCTA Technical Procedures Update* (July 19, 2006). This method is an iterative factoring process that considers model-projected growth and existing turning movements. The furness process corrects for base year model deviation, addressing locations where the model over/under estimates volumes.
- **Step 4** – As recommended in the *Technical Procedures* the forecasted volumes developed in Step 3 were reviewed for reasonableness. At locations where volumes did not appear reasonable (i.e. future year volumes lower than existing counts) adjustments were made to ensure that the forecasted volume was at least equal to the existing count and that volumes were balanced between adjacent intersections.

Project Land Use Inputs, Generation Rates, and Trip Assignment

Project trip generation refers to the process for estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates of the total amount of traffic entering and exiting the project area are calculated for an average weekday. Separate estimates are created for the peak one-hour periods during the morning and evening commute periods when traffic volumes on the surrounding streets are highest.

For projects that contain a mixture of uses, such as retail and office, it is reasonable to expect that some trips would occur internal to the site. Internal trips are defined as those which begin and end within the Planning Area and do not add any new trips to the external roadway network.

For retail uses, such as contained within the proposed project, driveway traffic comprises: (1) new traffic generated by the project, (2) traffic that would otherwise already be on the adjacent roadways but the driver decides to stop at the site (e.g., to purchase an item on their way home from work), and (3) traffic on other nearby roadways, but the driver decides to take a short detour to stop at the site. The trips in Item 2 are referred to as "pass-by" trips and the trips in Item 3 are referred to as "diverted-link" trips.

Trip generation estimates for the project were developed by using trip generation rates contained in the Institute of Transportation Engineers (ITE), *Trip Generation*, (7th Edition). Information contained in Chapter 7 of the *ITE Trip Generation Handbook*, June 2004, was used to estimate internal trips. The internal trip percentages reflect development-scale by application of the trip rate equations rather than the average trip rate values in the internalization spreadsheets. Because of the Planning Area's relationship to the surrounding road system, "pass-by" and "diverted-link" trips were not considered in the trip generation estimates. The transit reduction was calculated from empirical data from research completed in *Travel Characteristics of Transit-Oriented Development in California* (Lund / Cervero / Wilson 2004).

Table 3.4-7 presents the key project characteristics including: development size, base trip generation, internal capture percentages, transit reductions, and the resulting net vehicle trips that were assigned to the surrounding road system. As shown, the project includes 1.2 million square feet of office space, 2,500 residential units, 1 million square feet of retail uses, and 325 hotel rooms. It is also assumed that this project scenario includes construction of the new Phillips Lane interchange at SR 4.

Table 3.4-7 Development and Land Use Inputs for the Project

Office (ksf)	1200			
Residential (dwelling units)	2500			
Retail (ksf)	1000			
Hotel (rooms)	325			
Peak Hour Analyzed	AM		PM	
Trip Generation Rate (Office)	1.55		1.49	
Trip Generation Rate (Residential)	0.51		0.62	
Trip Generation Rate (Retail)	1.03		3.75	
Trip Generation Rate (Hotel)	0.56		0.59	
Raw Trip Generation Rate (Office)	1860		1788	
Raw Trip Generation Rate (Residential)	1275		1550	
Raw Trip Generation Rate (Retail)	1030		3750	
Raw Trip Generation Rate (Hotel)	196		207	
Internal Capture %	24%		29%	
Transit Reduction percent for HBW Trips	19%		17%	
Transit Reduction percent for Other Trips	6%		5%	
Net Trips (Office)	1118		1142	
Net Trips (Residential)	1004		992	
Net Trips (Retail)	527		2357	
Net Trips (Hotel)	175		194	
Net Trips In / Net Trips Out (Office)	984	134	194	947
Net Trips In / Net Trips Out (Residential)	201	803	347	645
Net Trips In / Net Trips Out (Retail)	322	206	1131	1225
Net Trips In / Net Trips Out (Hotel)	107	68	103	91
Note: The proposed Specific Plan assumes the Phillips Lane interchange in place.				

Source: Fehr & Peers, 2008

The project vehicle trips were distributed to the road system based on the CCTA Decennial Travel Demand Model. A different distribution was derived for the residential, office, and retail/hotel land uses. The model was then used to assign the vehicle trips to the surrounding road system. The assigned project trips were summed with the Year 2035 traffic forecasts to derive forecasts with the project.

Cumulative Land Use Inputs for Traffic Model

To represent year 2035 conditions, projected growth levels were extrapolated based on the ABAG *Projections 2007* figures on residential and employment levels for years 2020 and 2030. The land use forecasts were then scaled to ensure consistency with citywide 2035 land use totals from ABAG *P07*. Future growth in the Planning Area is based on the anticipated buildout of the proposed Specific Plan land uses. Growth outside the Planning Area has been reduced to maintain an overall consistency with the ABAG *P07* Projections for the east Contra Costa County area, including Antioch, Brentwood, and Oakley.

Tables 3.4-8 and Table 3.4-9 compare the number of households and jobs in the original CCTA countywide model (after the spring 2007 update) with the model scenarios as updated for this analysis.

Table 3.4-8 Comparison of Number of Households

Scenario	*Antioch*	*Brentwood*	*Oakley*	*Total*
2000 (CCTA Model) /1/	29,588	8,221	7,657	45,466
2007 (Project Model) /2/	33,822	15,568	10,070	59,460
2030 (CCTA Model) /1/	42,917	24,954	12,822	80,693
2035 (Project Model) /2/	43,720	31,180	14,780	89,680

/1/ Land use data as used in the CCTA Decennial Countywide Travel Demand Model and based on ABAG Projections 2005, updated in 2006-7 in cooperation with Antioch, Brentwood, Oakley, and other city staffs throughout Contra Costa County.

/2/ Land use derived from ABAG Projections 2007 by Fehr & Peers in cooperation with Antioch, Brentwood, and Oakley staff.

Source: Fehr & Peers, 2008.

Table 3.4-9 Comparison of Number of Jobs

Scenario	*Antioch*	*Brentwood*	*Oakley*	*Total*
2000 (CCTA Model) /1/	17,340	7,353	3,081	27,773
2007 (Project Model) /2/	22,178	8,074	3,672	33,924
2030 (CCTA Model) /1/	42,385	19,420	12,380	74,185
2035 (Project Model) /2/	42,110	19,580	10,610	72,300

/1/ Land use data as used in the CCTA Decennial Countywide Travel Demand Model and based on ABAG *Projections 2005*.

/2/ Land use derived from ABAG *Projections 2007* by Fehr & Peers in cooperation with Antioch, Brentwood, and Oakley Staff.

Source: Fehr & Peers, 2008.

Proposed Future Roadway Network

There are transportation improvement projects in East Contra Costa County that are intended to address existing and future traffic congestion. Those applicable to the Hillcrest Station Area are described below and were assumed to be completed by 2035. Planned roadway improvements are shown on Figure 3.4-6, and the Planning Area roadways are also shown on Figure 3.4-7.

Regional Improvements outside Planning Area

SR 4 Widening Project. The Contra Costa Transportation Authority (CCTA) in cooperation with the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are working to widen SR 4, upgrade its interchanges and affected local roadways from about 0.8 mile west of Loveridge Road to approximately 0.7 mile east of Hillcrest Avenue. The project will reduce existing traffic congestion, improve traffic operations, encourage high-occupancy vehicle (HOV) use, and accommodate travel demand anticipated through the year 2030.

SR 4 will be widened to eight lanes (three mixed flow lanes and one HOV lane in each direction) through the Hillcrest Avenue interchange where it will become a six-lane freeway (three mixed flow lanes in each direction). These lanes will ultimately connect to the six-lane SR 4 Bypass which was open to traffic in early 2008.

Interchange and affected local roadways will also be upgraded as part of the SR 4 Widening Project. Upgraded facilities will occur at the Loveridge Road, Somersville Road, Lone Tree Way/A Street, and Hillcrest Avenue interchanges. In addition, the G Street interchange will be removed and a new full access interchange will be provided at Contra Loma. The widened SR 4 corridor through the Hillcrest Avenue interchange will be widened to accommodate BART within the median.

Hillcrest Avenue Interchange Improvements. The Hillcrest Avenue interchange adjacent to the Planning Area is planned to be modified including: widening the eastbound SR 4 off-ramp to two lanes at the gore point, widening the overpass to allow for additional through and left turn lanes, adding a northbound to westbound loop on-ramp, constructing a westbound SR 4 hook ramp to Slatten Ranch Road. These improvements are consistent with those identified in the State Route 4 (East) Widening Project.

SR 4 Bypass Project. The State Route 4 Bypass Project (Bypass) is a roadway project being constructed cooperatively between Contra Costa County and the Cities of Antioch, Brentwood, Pittsburg, and Oakley. The Bypass is intended to ease traffic congestion in Antioch, Brentwood and Oakley; to provide access to the growing areas of southeast Antioch and western Brentwood; and, to provide more efficient connections throughout East Contra Costa County.

The Bypass will be constructed in three segments by 2020. Segment 1 extends from just east of the SR 4/Hillcrest Avenue Interchange to Lone Tree Way in the City of Antioch consists of a 6-lane freeway between existing SR 4 and the Laurel Road Interchange and a 4-lane freeway from Laurel Road to Lone Tree Way. This portion of the Bypass opened in March 2008. Segment 1 of the Bypass has been designed to accommodate the freeway-to-freeway connectors between SR 160 and SR 4, east of the SR 4/SR 160 interchange. Phase 1 of Segment 2 was constructed in 2002 as a 2-lane Expressway from Lone Tree Way to Balfour Road. Future phases will convert Segment 2 to a full freeway with interchanges at Sand Creek Road and Balfour Road. Segment 3 extends from Balfour Road south to Marsh Creek Road as a 2-lane Expressway, then along Marsh Creek Road (East-West Connector) as a 2-lane conventional highway, connecting to existing SR 4 (Byron Highway).

It is expected that Caltrans will relinquish the existing highway through Antioch and Brentwood and accept the Bypass as the new State Route 4 sometime in 2010.

Local Road Improvements outside the Planning Area

Roadway improvements are identified on the General Plan Circulation Map that could affect traffic flow in the vicinity of the project location.

East 18th Street Widening. This project is currently under construction and will widen East 18th Street to provide a continuous four-lane roadway with a median from SR 160 to Viera Avenue. This project is a gap closure project so that the corridor will be a continuous four-lane facility through the study area. This project is fully funded.

Wild Horse Road Extension. This project would extend the two-lane Wild Horse Road from its current terminus (east of Hillcrest Avenue) to Slatten Ranch Road. The Wild Horse Road extension would be constructed as part of planned residential development along the corridor. Because the planned development has been assumed in this analysis, the road extension is also

assumed. If the development does not occur, then the road would not be needed and would not be constructed.

Laurel Road Extension. This project would extend Laurel Road between its current terminus in Antioch and Hillcrest Avenue. The Laurel Road extension would be constructed as part of planned development along the corridor. Because the planned development has been assumed in this analysis, the road extension is also assumed. If the development does not occur, then the road would not be needed and would not be constructed.

Road Improvements Proposed as Part of Specific Plan

Phillips Lane Interchange. The Phillips Lane interchange is identified in the *2008 Contra Costa Countywide Transportation Plan*. The interchange project is not funded at this time. In addition, there are policy considerations that are currently being evaluated as part of a city-sponsored study effort. Specifically, the interchange spacing between the Phillips Lane Interchange and the SR 160 connector would require a mandatory design exception per Index 501.3 of Caltrans *Highway Design Manual*. For purposes of the traffic analysis in this EIR, the interchange is assumed to be in place. However, the project may not be feasible, because Caltrans will need to approve the design and accept the mandatory design exception, and funding needs to be identified. Therefore the EIR also contains qualitative analysis of traffic impacts in the event that the Phillips Lane Interchange is not constructed. Furthermore, the Specific Plan contains policies that limit the amount and extent of development in the Hillcrest Station Area if the Phillips Lane Interchange is not constructed.

Oakley Road Extension. This project would include a two-lane roadway extending from Oakley Road at Viera Avenue to the west, terminating at the PG&E facilities. While it is shown on the General Plan circulation map as extending all the way to Hillcrest Avenue, this is not feasible due to the location of the PG&E facilities and the proximity to existing intersections.

Slatten Ranch Road Extension. This project would continue Slatten Ranch Road north from Laurel Road as a two lane roadway to Phillips Lane, and then as a four-lane roadway from Phillips Lane to Hillcrest Avenue. The extension would intersect Hillcrest Avenue opposite the existing Sunset Drive signalized intersection. New SR 4 westbound ramps would be constructed at Slatten Ranch Road.

Phillips Lane Extension. This project would include a two- to four-lane roadway with a median from East 18th Street to the Slatten Ranch Road Extension. This project would also include a grade separation at the railroad tracks, and possibly a new interchange with SR 4.

Viera Avenue Extension. This project would include a two-lane roadway from East 18th Street to the Slatten Ranch Road Extension. A central third lane would be included between the PG&E easement and Slatten Ranch Road; the central lane would function as a turn lane near intersections, and would be a landscaped median in other segments. This project includes constructing a left-turn lane from northbound Viera Avenue to westbound East 18th Street. It would include a bypass around the existing residential neighborhood and a grade separation at the railroad tracks.

Hillcrest Avenue and East 18th Street Intersection. This project includes providing protected left-turn traffic signal phasing, constructing a second left-turn lane from northbound Hillcrest

Avenue to westbound East 18th Street, and a right-turn lane from eastbound East 18th Street to southbound Hillcrest Avenue.

Neroly Road and Oakley Road Intersection. This project includes the City of Oakley installing a traffic signal, constructing left-turn lane and a shared through/right-turn lane at each intersection approach. This project is not currently identified in the Oakley General Plan or Capital Improvement Program.

Hillcrest Avenue Railroad Grade Separation. This project shown on the circulation map would separate the railroad from Hillcrest Avenue by constructing a rail over-crossing at Hillcrest Avenue. Funding for the grade separation project has not been identified, and so it is not assumed in the analysis.

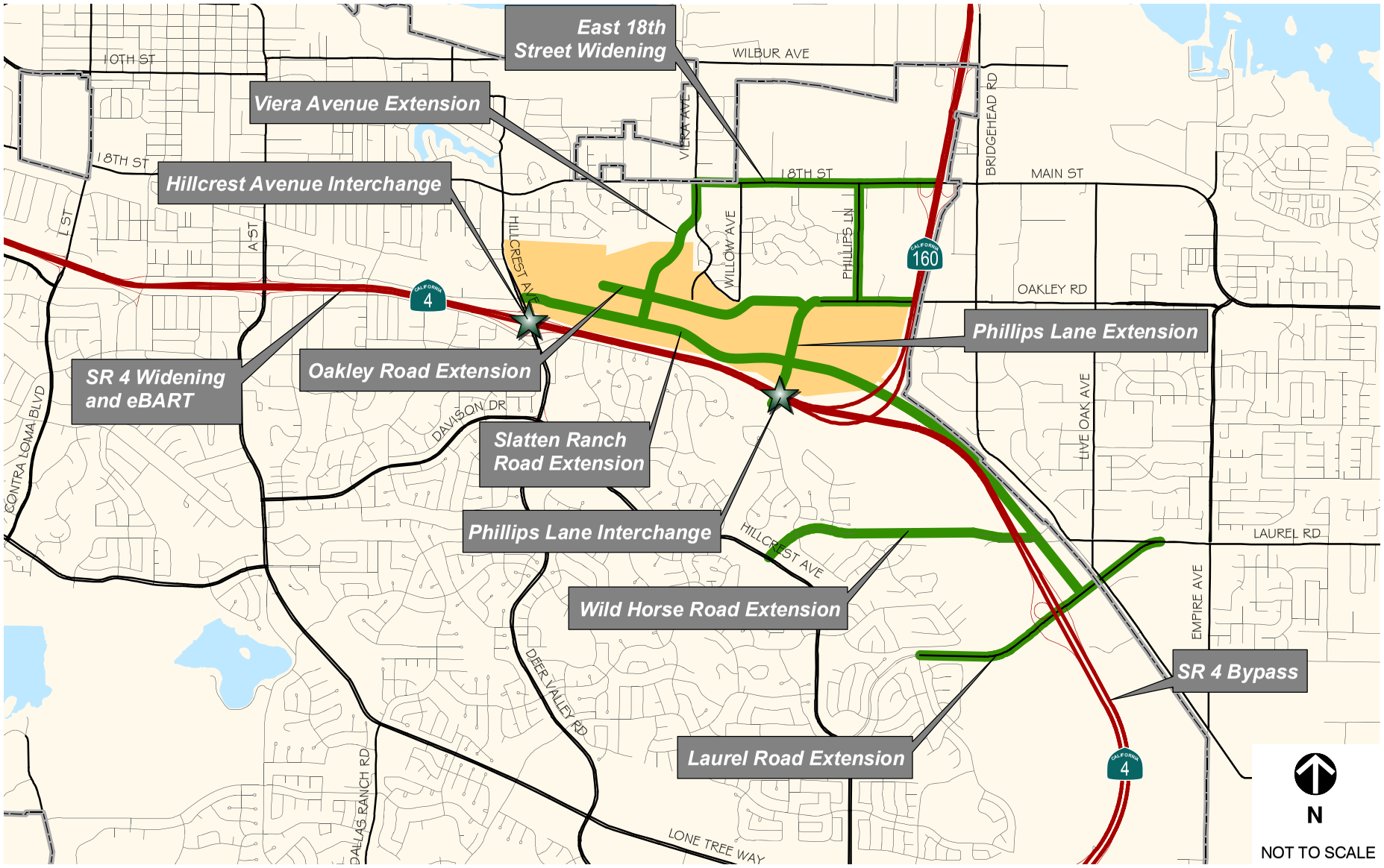
Planned Transit Improvements

This EIR assumes that the eBART Phase 1 Proposed Project, consisting of Diesel Multiple Unit technology running from a transfer station located just east of the Pittsburg/Bay Point BART platform and extending down the median of SR 4 will be constructed and operational by 2015 as planned by BART. One eBART station would be located in Pittsburg at Railroad Avenue and the terminus station for Phase 1 would be near Hillcrest Avenue in Antioch. The terminus station will be located in the SR 4 median either 1,275 feet (Median Station) or 2,175 feet (East Median Station) from the Hillcrest Avenue/SR 4 Interchange. A potential second station is planned adjacent to the railroad right-of-way near the Phillips Lane and Slatten Ranch Road intersection.

In addition, Tri Delta Transit is expected to continue offering service from a new transit center near the eBART station in the median.

Proposed Pedestrian and Bicycle Circulation and Access Improvements

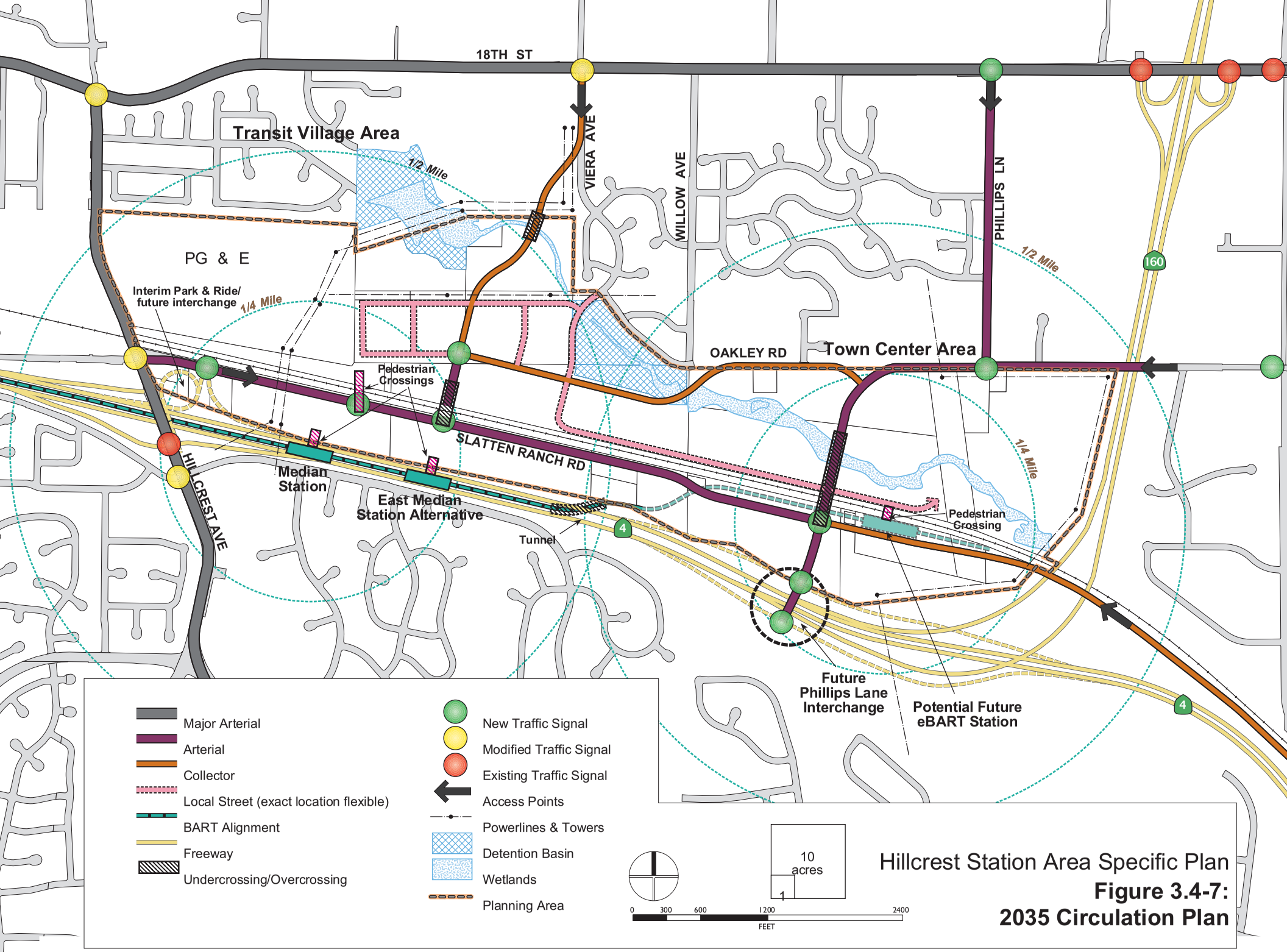
This EIR assumes that in addition to the bicycle routes planned in the General Plan, the improvements indicated on Figure 3.4-8 will also be constructed.



Hillcrest Station Area Specifc Plan

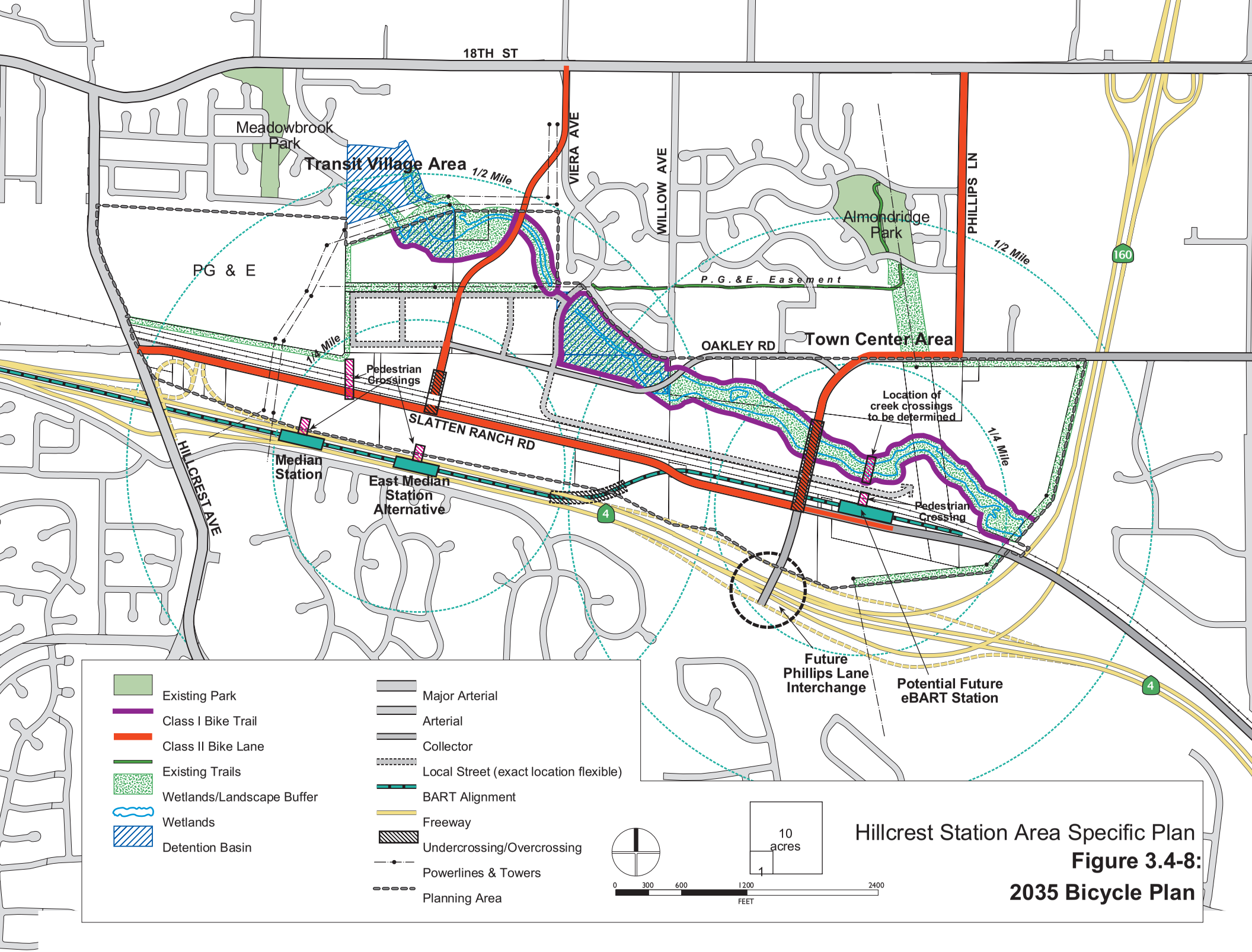
Figure 3.4-6: Regional, City, and Planning Area Roadway Improvements

Source: Fehr & Peer, 2008.



Hillcrest Station Area Specific Plan

Figure 3.4-7:
2035 Circulation Plan



Hillcrest Station Area Specific Plan

Figure 3.4-8:

2035 Bicycle Plan

Freight Rail

Union Pacific has announced plans to increase the number of trains on the Mococo Line running through the Planning Area to as many as 10-15 trains per day initially and as many as 25-40 trains per day in the long term. As part of the worst case scenario, this EIR assumes that there will be 40 trains per 24-hour period in 2035. This traffic analysis also assumes that a grade separation at Hillcrest Avenue and the Union Pacific Mococo Railroad is implemented in a timely manner, i.e. before train traffic causes a back-up on the SR 4 mainline due to stopping traffic at the Hillcrest Avenue Interchange. However the grade separation project is not included in the Contra Costa County Regional Transportation Plan, and is not designed or funded. Therefore qualitative analysis also describes how circulation would be impacted if the rail line traffic increases as proposed by Union Pacific and the grade separation is not constructed.

IMPACTS AND MITIGATION MEASURES

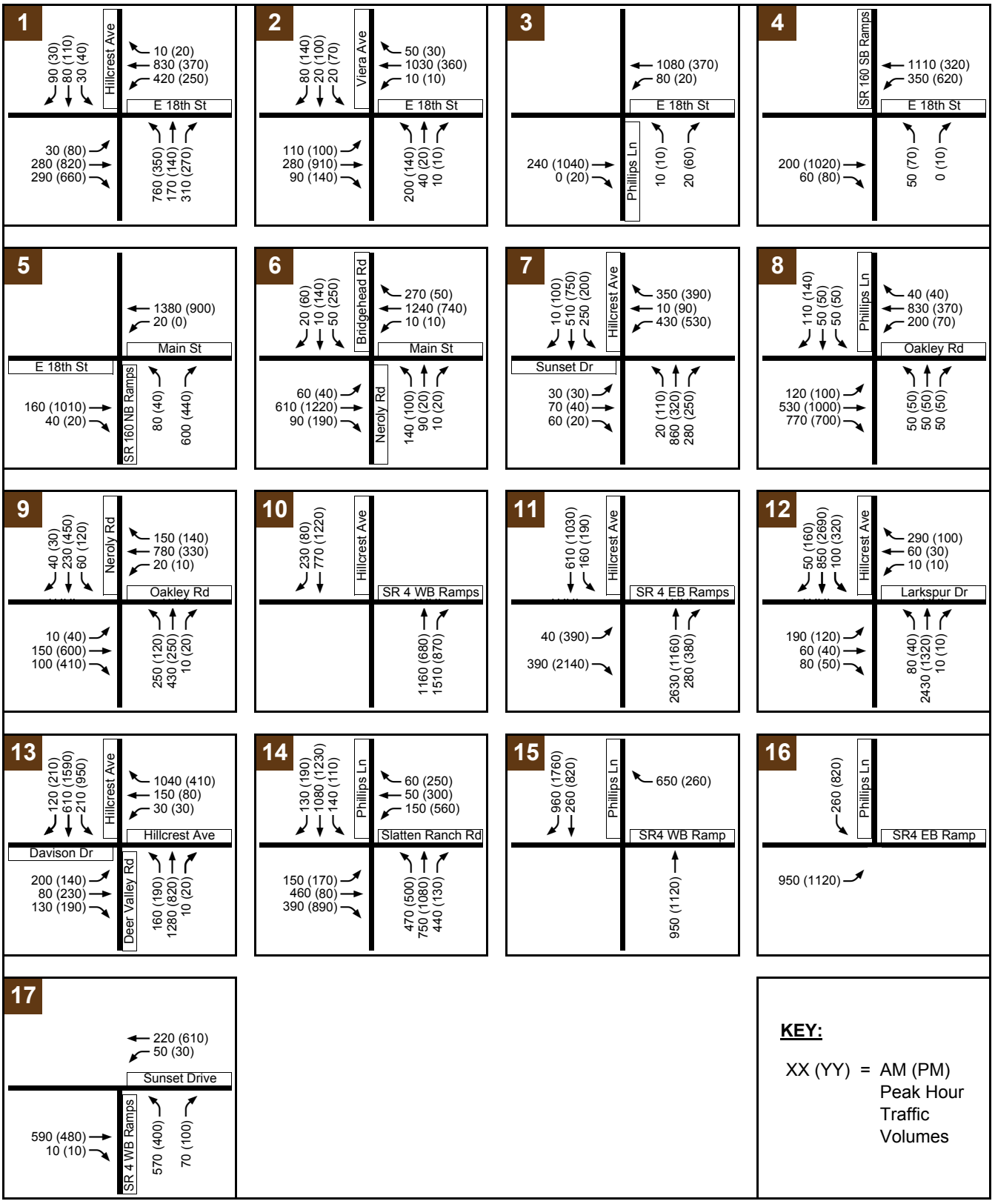
3.4-1 ***Increased motor vehicle traffic would result in unacceptable level of service (LOS) at study intersections. (Significant and Unavoidable)***

The proposed Specific Plan intersection traffic forecasts are presented in Figure 3.4-9. Tables 3.4-10, 3.4-11, and 3.4-12 contain the results of the traffic analysis for the buildout of the proposed Specific Plan in 2035. The first table shows traffic operations results based on the HCM Methodology. The second table shows traffic operations results made with the CCTA Methodology. The third table illustrates the percent of vehicles served in 2035 as compared to existing conditions. Figure 3.4-10 shows the LOS results from the HCM analysis graphically.

As shown in the tables, buildout from regional growth and the land uses envisioned with the proposed Specific Plan would result in significant impacts at the following study intersections:

- Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue intersection would operate at LOS F during the AM and PM peak hours.
- Hillcrest Avenue at SR 4 Eastbound Ramp intersection would operate at LOS F during the PM peak hour.

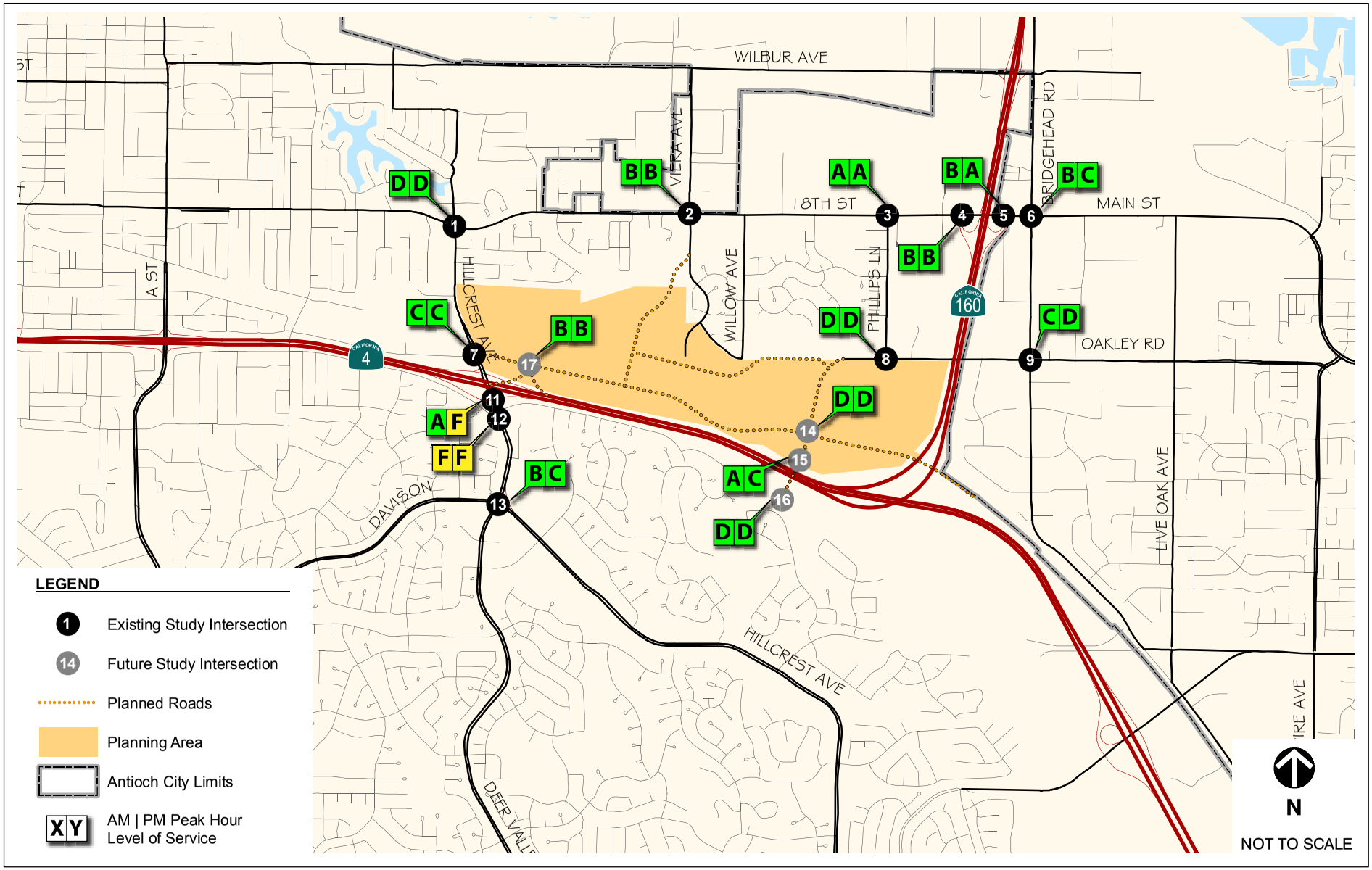
These findings are based on the HCM method rather than the CCTA method. The HCM method used in this study at the Hillcrest Avenue interchange recognizes the influence of closely spaced intersections on the vehicle capacity. The vehicle queues (which extend through adjacent intersections) and signal coordination parameters preclude use of volume-to-capacity traffic analysis tools, such as the CCTA method, as they cannot adequately identify intersection delay, level of service (LOS), and queue lengths. Analysis packages such as the CCTA method are not sensitive to detailed intersection design features such as turn-pocket lengths, atypical intersection geometrics, and closely-spaced intersections (e.g. the effects of the adjacent intersection through the Hillcrest Avenue interchange). For these reasons, we concur with the 2000 *Highway Capacity Manual* and recommend the use of the HCM methods through micro-simulation to analyze intersection operations. Specifically, we used the SimTraffic microsimulation platform to assess the 2035 conditions at the Hillcrest interchange because it is capable of producing results that have a higher degree of precision than the CCTA method. In addition, it is commonly used for similar situations in Antioch and the rest of Contra Costa County, and it is often used by Caltrans to evaluate ramp termini intersections.



Hillcrest Station Area Specifc Plan

Figure 3.4-9: 2035 Intersection Traffice Volume Forecasts

Source: Fehr & Peer, 2008.



Hillcrest Station Area Specifc Plan

Figure 3.4-10: 2035 Intersection Level of Service Results

Source: Fehr & Peer, 2008.

Table 3.4-10 Intersection Operations Weekday AM and PM Peak Hour – HCM Methodologies

Assumptions: This table assumes implementation of all plan policies to mitigate intersection operations, including Phillips Lane Interchange, and grade separation at Hillcrest Ave and railroad.

Intersection	*Control*	*Peak Hour*	*Specific Plan Buildout 2035*	
			Delay /1/	*LOS*
1. Hillcrest Avenue at East 18th Street	Signal	AM PM	41 36	D D
2. Viera Avenue at East 18th Street	Signal	AM PM	16 13	B B
3. Phillips Lane at East 18th Street	Signal	AM PM	6 6	A A
4. SR 160 Southbound Ramps at East 18th Street	Signal	AM PM	15 16	B B
5. SR 160 Northbound Ramps at East 18th Street	Signal	AM PM	11 10	B A
6. Bridgehead Road/Neroly Road at Main Street	Signal	AM PM	14 27	B C
7. Hillcrest Avenue at Sunset Drive	Signal	AM PM	26 33	C C
8. Phillips Lane at Oakley Road	Signal	AM PM	44 36	D D
9. Neroly Road at Oakley Road	Signal	AM PM	46 34	D C
10. Hillcrest Avenue at SR 4 Westbound Ramps	No Control	AM PM	This intersection is replaced with a northbound to westbound loop ramp to SR 4 as part of the planned Hillcrest Interchange Improvement Project.	
11. Hillcrest Avenue at SR 4 Eastbound Ramps	Signal	AM PM	9 **#**	A **F**
12. Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue	Signal	AM PM	**>100** **#**	**F** **F**
13. Hillcrest Avenue at Deer Valley Road/Davidson Drive	Signal	AM PM	19 25	B C
14. Phillips Lane at Slatten Ranch Road	Signal	AM PM	47 55	D D
15. Phillips Lane at SR 4 Westbound Ramps	Signal	AM PM	8 11	A C
16. Phillips Lane at SR 4 Eastbound Ramps	Signal	AM PM	44 41	D D
17. SR 4 Westbound Ramps at Slatten Ranch Road	Signal	AM PM	12 12	B B

Bold indicates intersection operating at deficient level of service.

# indicates that delay is not meaningful because not all the vehicles are able to traverse the intersection during the PM peak hour.

/1/ Delay is measured in seconds and represents average intersection control delay using the HCM methods.

Source: Fehr & Peers, 2008.

Table 3.4-11: Intersection Operations Weekday AM and PM Peak Hour – CCTA Methodology

Assumptions: This table assumes implementation of all plan policies to mitigate intersection operations, including Phillips Lane Interchange, and grade separation at Hillcrest Ave and railroad.

Intersection	*Control*	*Peak Hour*	*Specific Plan Buildout 2035*	
			V/C	*LOS*
1. Hillcrest Avenue at East 18th Street	Signal	AM PM	0.861 0.806	D D
2. Viera Avenue at East 18th Street	Signal	AM PM	0.539 0.508	A A
3. Phillips Lane at East 18th Street	Signal	AM PM	0.317 0.344	A A
4. SR 160 Southbound Ramps at East 18th Street	Signal	AM PM	0.352 0.559	A A
5. SR 160 Northbound Ramps at East 18th Street	Signal	AM PM	0.453 0.336	A A
6. Bridgehead Road/Neroly Road at Main Street	Signal	AM PM	0.410 0.566	A A
7. Hillcrest Avenue at Sunset Drive	Signal	AM PM	0.574 0.579	A A
8. Phillips Lane at Oakley Road	Signal	AM PM	0.727 0.794	C C
9. Neroly Road at Oakley Road	Signal	AM PM	0.791 0.730	C C
10. Hillcrest Avenue at SR 4 Westbound Ramps	No Control	AM PM	This intersection is replaced with a northbound to westbound loop ramp to SR 4 as part of the planned Hillcrest Interchange Improvement Project.	
11. Hillcrest Avenue at SR 4 Eastbound Ramps	Signal	AM PM	0.561 0.761	A C
12. Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue	Signal	AM PM	0.820 0.683	D B
13. Hillcrest Avenue at Deer Valley Road/Davidson Drive	Signal	AM PM	0.816 0.681	D B
14. Phillips Lane at Slatten Ranch Road	Signal	AM PM	0.852 0.926	D E
15. Phillips Lane at SR 4 Westbound Ramps	Signal	AM PM	0.484 0.409	A A
16. Phillips Lane at SR 4 Eastbound Ramps	Signal	AM PM	0.343 0.562	A A
17. SR 4 Westbound Ramps at Slatten Ranch Road	Signal	AM PM	0.370 0.483	A A

Bold indicates intersection operating at deficient level of service.

-- indicates that CCTA methodology does not analyze stop-controlled intersections.

Source: Fehr & Peers, 2008.

Table 3.4-12 Intersection Operations Weekday AM and PM Peak Hour – Percent Vehicles Served

Assumptions: This table assumes implementation of all plan policies to mitigate intersection operations, including Phillips Lane Interchange, and grade separation at Hillcrest Ave and railroad.

	Existing		*Specific Plan Buildout 2035*	
Intersection	*AM*	*PM*	*AM*	*PM*
7. Hillcrest Avenue at Sunset Drive	101%	98%	96%	97%
11. Hillcrest Avenue at SR 4 Eastbound Ramps	97%	91%	92%	87%
12. Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue	97%	92%	92%	88%
17. SR 4 Westbound Ramps at Slatten Ranch Road	n/a	n/a	97%	99%

Percent vehicle served is calculated by dividing the actual number of vehicles able to traverse the intersection by the total number of vehicles forecast to traverse the intersection. Intersections with values less than 95percent are considered to be operating at deficient levels. The SimTraffic component of the Synchro software was used to determine vehicles served.

Source: Fehr & Peers, 2008.

It should also be noted that, if the Union Pacific Railroad moves forward with its stated intention of resuming regular train operations on the Mococo Line and if the rail crossing at Hillcrest Avenue remains an at-grade crossing, then substantially more congestion and vehicle queuing would be expected at the two intersections above and throughout the Hillcrest Avenue interchange area during times of train crossings. There remains a great deal of uncertainty about when train traffic might resume and how many trains per day would be operated, as well as whether the existing tracks, which have not been maintained for many years, would be upgraded to allow higher speeds through the area. This is not an impact of the proposed Specific Plan project. It is anticipated that the resumption of rail operations would be the subject of negotiations between the UP and the City of Antioch. The Specific Plan proposal to extend Phillips Lane (with grade separation at the Union Pacific Railroad) and construct an interchange at SR 4 would provide alternative north/south travel between SR 4 and northeast Antioch; thereby, shifting some traffic away from the Hillcrest Avenue rail crossing.

Specific Plan Policies that Reduce Impact

The following proposed policies could help reduce this impact, but the impact would remain significant at some locations unless mitigated at the study intersections:

Street Network

C-1 Create a connected street network of arterials and collectors that connects with existing local and regional roadways, and provides circulation throughout the Station Area.

C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish:

- Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and,

- Maximum block lengths of approximately 450 feet, or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block).

C-4 Require land dedication and street improvements to be built consistent with street designs described in Chapter 4, Urban Design, for all arterials, collectors, and local streets in the Hillcrest Station Area.

C-5 Limit potential traffic and parking impacts from new development on existing neighborhoods by:

- Re-routing existing collector alignments outside existing neighborhoods, where feasible;
- Providing direct access to the arterial and regional road network from any new streets; and,
- Installing traffic calming measures where necessary.

C-6 Minimize cul-de-sacs to the maximum extent possible. Where cul-de-sacs are necessary due to barriers such as freeways and detention basins:

- Provide at least one pedestrian and bicycle path at the circular end in order to connect to other streets and trails, to allow emergency vehicle access when warranted and to minimize response times for emergency access; and,
- Consider designing cul-de-sacs with a planted cul-de-sac island to limit the amount of pavement and increase stormwater management opportunities.

Station Area Street Improvements

C-8 All applications for master plans, subdivisions, and development projects shall indicate how streets are connected to existing local and regional roadways, and how a connected network of streets is created throughout the Hillcrest Station Area.

C-9 Arterials and collectors should be located as shown in Figure 3-4 Circulation Plan; however, locations may be modified based on additional engineering or environmental analysis, or a completed master plan that shows how all parcels will be adequately served. Streets shall be located consistent with the following criteria:

- Arterials are to be generally located along property lines.
- Collector alignments may vary to accommodate site conditions and development proposals, provided that the streets align and join directly with existing and/or future collector streets on adjoining properties.

C-10 Construct a four-lane east-west road, Slatten Ranch Road, south of the Union Pacific Railroad from Hillcrest Avenue to SR 160 to serve the eBART Station and development between SR 4 and the Union Pacific right-of-way. Design this road consistent with the following criteria:

- Connect Sunset Drive west of Hillcrest Avenue with the Station Area;
- Accommodate easy and direct access for buses in and out of the eBART station; and

- Ensure that BART service can be extended to the east in or adjacent to the Union Pacific railroad right-of-way. Design of this corridor will need to be coordinated with Caltrans, Union Pacific Railroad, and BART.

C-11 The City shall address traffic congestion at the Hillcrest Avenue and East 18th Street intersection. Starting in 2015, the City shall monitor the turning movements at this intersection with annual traffic counts.

- When the average delay per vehicle is exceeds 45 seconds (or the current CCTA level of service standard), the City engineer shall initiate a comprehensive engineering study to define feasible mitigations and the project's fair share of the cost of improvements.
- When the average delay per vehicle is 55 seconds (or the Level of Service reaches E), proceed with design and construction of the improvements defined in the engineering study.

C-12 Extend and re-align Viera Avenue between East 18th Street and Slatten Ranch Road. Design this road consistent with the following criteria:

- Realign Viera Avenue so that Station Area traffic does not impact existing neighborhoods, as generally shown in Figure 3-4.
- Add a left turn lane from northbound Viera Avenue to westbound East 18th Street.
- Work with PG&E to design the alignment so that Viera Avenue minimizes impacts to the PG&E electrical transmission and natural gas rights-of-way.
- Construct an overcrossing at East Antioch Creek that minimizes impacts to the creek, detention basins, and recreational areas.
- Construct an overcrossing or undercrossing at the railroad tracks that serves vehicles, pedestrians, and bicycles. Design the crossing to maximize developable land. The design of this crossing should also be coordinated with the design of the railroad grade separation at Hillcrest Avenue.

C-13 Extend and improve Oakley Road to serve the Hillcrest Station Area. Design this road consistent with the following criteria:

- Minimize impacts to the Oakley Detention Basin;
- Limit traffic and parking from the Station Area within existing neighborhoods;
- Support and encourage pedestrian-oriented land uses between the Oakley Detention Basin and the PG&E substation; and,
- Do not preclude a future connection with Hillcrest Avenue featuring a right-in, right-out intersection, if warranted.

C-15 Extend and improve Phillips Lane south of East 18th Street to Slatten Ranch Road. Design this road consistent with the following criteria:

- Serve the development within the Town Center;
- Minimize impacts to East Antioch Creek and recreational uses;
- Cross over the railroad;

- Intersect with Slatten Ranch Road; and
- Provide access to the Phillips Lane Interchange.

City and Regional Transportation Improvements

C-16 Work with CCTA and Caltrans to implement Hillcrest Avenue Interchange improvements. The final design of the improvements should consider the potential railroad grade separation at Hillcrest Avenue.

C-17 Work with Union Pacific Railroad to provide a grade separation at the intersection of the Mococo Railway right-of-way and Hillcrest Avenue, if it is determined that the rail operator will resume active rail service. Explore all feasible design solutions with the goal to minimize the impacts on existing development and new development in the Hillcrest Station Area.

C-18 Work with Caltrans to approve, design, and construct a full SR 4 interchange at Phillips Lane. Work with federal, state, and local agencies such as the Fee and Finance Authority to secure funding for the Phillips Interchange.

C-19 The City and project sponsors shall work with neighboring cities and regional agencies to construct Slatten Ranch Road from west of SR 160 to Laurel Avenue.

C-20 The City shall ensure that Wild Horse Road is extended and connected to the SR 4 Bypass Frontage Road, "Slatten Ranch Road," to improve local access to parks, schools, and fire stations.

C-21 Work with the City of Oakley to monitor traffic levels and level of service at the Neroly Road and Oakley Road intersection, and support efforts to design and construct needed improvements.

Transportation Demand Management

C-22 Apply a Transportation Demand Management (TDM) program that reduces single-occupant vehicle trips to development exceeding 25,000 square feet of non-residential space. Components of TDM programs could include:

- Contributions to urban design projects, such as:
  - Bicycle parking, both short- and long-term, located in appropriate places; and,
  - Direct routes to transit (station, shuttle, or bus) and other key destinations that are well-lit and designed for pedestrian comfort.
- Employer-based programs, such as:
  - Carpool and vanpool ride-matching services;
  - Designated employer TDM contact;
  - Guaranteed ride home for transit users and car/vanpoolers;
  - Transit subsidies for employees;
  - Flexible work schedules, shortened work weeks, or options to telecommute;
  - Information campaigns using brochures, boards/kiosks, or other communication outlets; and,

  - Employer provided showers and lockers.
- Meeting or exceeding project design standards, such as:
  - Free and preferential parking for carpools, vanpools, low-emission vehicles, and car-share vehicles;
  - Passenger loading zones; and,
  - Bicycle- and pedestrian- friendly site planning and building design.

Road Network Implementation

I-5 Construct the following circulation improvements in conjunction with development of the Freeway Area:

- Slatten Ranch Road from Hillcrest to SR 160
- At least one emergency access route connecting Slatten Ranch Road to Oakley Road

I-7 Construct the following circulation improvements in conjunction with development of the Transit Village Area:

- Viera Avenue (New) from East 18th Street to Oakley Road
- Viera Avenue Connection from Oakley Road to Slatten Ranch Road, with an Overcrossing or Undercrossing of the Railroad Line
- Pedestrian/Bicycle Bridge over the Railroad Line to the eBART Station Entrance (required only if the Median Station is selected instead of East Median)
- Oakley Road from Viera Avenue (New) to Willow Ave.

I-9 Development within the Town Center Area shall not occur until the Phillips Lane Interchange is officially approved by Caltrans and funding sources are identified, or other regional transportation improvements that resolve the projected congestion at the SR 4/Hillcrest Interchange are identified, included in the Contra Costa County Regional Transportation Plan, and funding sources are identified.

I-11 Construct the following circulation improvements in conjunction with development of the Town Center Area north of East Antioch Creek.

- Widen Oakley Road from SR 160 to Willow Avenue
- Redesign the Willow Avenue/Oakley Road Connection
- Phillips Lane from East 18th Street to Oakley Road

I-12 Construct the following circulation improvements in conjunction with development of the Town Center Area south of East Antioch Creek.

- Phillips Lane Connection to Slatten Ranch Road: Overcrossing
- Phillips Lane and SR 4 Interchange
- Phillips Lane from Slatten Ranch Road to SR 4 and Interchange

Mitigation Measures Considered and Determined Infeasible

Following adoption of the policies and goals, impacts would be reduced to less than significant at some study intersections, but significant impacts would remain at the following study intersections: Hillcrest Avenue at Tregallas Drive/Larkspur Avenue and Hillcrest Avenue at SR 4 Eastbound Ramp. While roadway network improvements could reduce traffic impacts at these two intersections, the level of improvement would not be sufficient to bring them into compliance with the adopted standards.

The City has considered additional measures to comply with the LOS criteria at these two intersections. Measures considered include realigning Tregallas Drive and Larkspur Avenue to the south to improve vehicle storage between this intersection and the SR 4 eastbound off-ramp intersection. This change was determined to be infeasible during the planning horizon because it would require the acquiring and demolition of active and viable commercial properties, residential properties, and a church south of the Planning Area.

Other measures considered such as realigning the Hillcrest Avenue corridor and constructing new/modified ramps to/from SR 4 eastbound would have similar right-of-way impacts. In addition, the adopted policies and goals include construction of improvements at two intersections located outside the Planning Area. Policy C-11 addresses intersection capacity improvements at the Hillcrest Avenue/East 18th Street intersection which is located in the City of Antioch. Policy C-21 addresses capacity improvements at the Neroly Road/Oakley Road intersection which is located in the City of Oakley. Without implementing these policies both intersections would operate at unacceptable LOS E or F conditions in 2035 with buildout of the Specific Plan.

3.4-2 ***Increased motor vehicle traffic would result in increased Delay Indices at study freeway segments. (Significant and Unavoidable)***

Freeway Traffic Forecasts with the Phillips Lane Interchange at SR 4

The proposed Specific Plan freeway traffic forecasts are presented in Table 3.4-13 and Table 3.4-14 contain the results of the traffic analysis for the buildout of the proposed Specific Plan in 2035. The tables also illustrate the 2035 conditions as compared to existing conditions.

Traffic induced from the buildout of the land uses envisioned with the proposed Specific Plan would not result in significant impacts on freeway operations, if the Phillips Lane Interchange at SR 4 is constructed in a timely manner. While the traffic forecasts in year 2035 are substantially greater than year 2007 traffic, the additional freeway capacity planned for SR 4 combined with the Phillips Lane Interchange will accommodate the expected growth in traffic. Following adoption of the policies and goals, impacts would be reduced to less than significant at the study freeway segments.

Table 3.4-13 2035 Freeway Traffic Volumes

Assumptions: This table assumes implementation of all plan policies to mitigate intersection operations, including Phillips Lane Interchange, and grade separation at Hillcrest Ave and railroad.

Freeway Segment	*Eastbound AM Peak Hour*	*Westbound AM Peak Hour*	*Eastbound PM Peak Hour*	*Westbound PM Peak Hour*
SR 4, West of Hillcrest Avenue	3,770	6,450	7,370	5,560
Percent Change from Existing /1/	*85% (2,040)*	*170% (2,390)*	*98% (3,720)*	*93% (2,880)*
SR 4, East of Hillcrest Avenue	3,780	5,290	5,410	5,070
Percent Change from Existing /1/	*260% (1,050)*	*295% (1,340)*	*153% (2,140)*	*204% (1,670)*
SR 4 (Bypass), West of Laurel Rd	2,120	4,960	5,140	2,830
Percent Change from Existing	*Data Unavailable*			
SR 160, South of East 18th St	510	1,180	1,230	620
Percent Change from Existing /1/	*-51% (1,050)*	*-12% (1,340)*	*-43% (2,140)*	*-63% (1,670)*

/1/ Value in parenthesis represents the existing traffic volume.

Source: Fehr & Peers; Dyett & Bhatia, 2008.

Table 3.4-14 2035 Freeway Operations

Assumptions: This table assumes implementation of all plan policies to mitigate intersection operations, including Phillips Lane Interchange, and grade separation at Hillcrest Ave and railroad.

Specific Plan	*Eastbound AM Peak Hour*	*Westbound AM Peak Hour*	*Eastbound PM Peak Hour*	*Westbound PM Peak Hour*
SR 4 between the A Street and Laurel Road interchanges				
Average Travel Speed (mph)	70	69	64	69
Delay Index /1/	1.00	1.02	1.09	1.01
Percent change from existing Delay Index /2/	0% (1.00)	-33% (1.52)	7% (1.02)	1% (1.00)
SR 160 between the SR 4 and Wilbur Avenue interchanges				
Average Travel Speed (mph)	70	70	70	70
Delay Index /1/	1.00	1.00	1.00	1.00

1. Delay Index is calculated as the free-flow speed (assumed to be 70 mph) divided by the average travel speed. The Traffic Service Objective defined by CCTA is a Delay Index of less than 2.5.

2. Value in parentheses represents the existing Delay Index.

Source: Fehr & Peers, 2008.

Specific Plan Policies that Reduce Impact

The proposed policies listed under Impact 3.4-1 would also help to reduce the impact on freeway operations.

Freeway Traffic Forecasts without Construction of the Phillips Lane Interchange at SR 4, and Without Any New Development in the Hillcrest Station Area

Significant and unavoidable freeway impacts would remain if the Phillips Lane Interchange is not constructed. Without the interchange the forecasted traffic volumes would overwhelm the Hillcrest Avenue Interchange, causing severe congestion extending back onto the mainline SR 4

freeway during the PM peak hours. While the Specific Plan calls for the Phillips Lane Interchange (Policy C-18), its implementation is not certain. Funding has not been identified for the interchange, and its proposed location would require a mandatory design exception from Caltrans related to interchange spacing. Thus, the impact to the freeway system is considered significant and unavoidable.

The City has considered measures to address the severe traffic congestion at the Hillcrest Avenue Interchange beyond those identified in the State Route 4 East Widening Project including additional ramp widening, alternative interchange configurations, and realigning local roads to improve interchange efficiency. These changes would all require the acquiring and demolition of active and viable commercial properties, residential properties, and a church south of the Planning Area. The alternatives were considered infeasible given the substantial impact to the right-of-way.

A sensitivity test was conducted at the Hillcrest Avenue Interchange to determine the approximate future year when the Phillips Lane Interchange would need to be constructed to accommodate the eBART station and additional development outside the Specific Plan Area, consistent with ABAG land use forecasts. This analysis presents the traffic situation that will result without any development in Hillcrest Station Area. The resulting 2035 freeway traffic forecasts are shown in Table 3.4-15.

The traffic model indicates that by 2035 with no specific plan area development except for the implementation of the eBART project with a station near Hillcrest Avenue, traffic at the Hillcrest intersection would cause a back-up on the SR 4 mainline during peak travel times and cause significant increases in the delay indices. Refer to Table 3.4-16 for the traffic analysis results. Therefore, it can be anticipated that any additional development would create worse delays.

The Phillips Lane Interchange, as proposed in the Specific Plan, would provide the additional access and circulation necessary to reduce this impact to less than significant levels. Without the interchange, the freeway system would operate below acceptable standards.

Table 3.4-15 2035 Freeway Traffic Volumes Without Phillips Lane Interchange

Assumptions: – No Station Area Development, and with the eBART station and parking

Freeway Segment	*Eastbound AM Peak Hour*	*Westbound AM Peak Hour*	*Eastbound PM Peak Hour*	*Westbound PM Peak Hour*
SR 4, West of Hillcrest Avenue	2,990	6,100	6,610	4,160
Percent Change from existing	*47% (2,040)*	*155% (2,390)*	*78% (3,720)*	*44% (2,880)*
SR 4, East of Hillcrest Avenue	2,820	4,670	4,620	3,310
Percent Change from existing	*169% (1,050)*	*249% (1,340)*	*116% (2,140)*	*98% (1,670)*
SR 4 (Bypass), West of Laurel Rd	1,850	4,630	4,650	2,570
Percent Change from existing	*Data Unavailable*			
SR 160, South of East 18th St	1,800	870	1,080	1,850
Percent Change from existing	*71% (1,050)*	*-35% (1,340)*	*-50% (2,140)*	*10% (1,670)*

Source: Fehr & Peers, 2008.

Table 3.4-16 2035 Freeway Operations Without Phillips Lane Interchange

Assumptions: – No Station Area Development, and with the eBART station and parking

	Eastbound AM Peak Hour	*Westbound AM Peak Hour*	*Eastbound PM Peak Hour*	*Westbound PM Peak Hour*
SR 4 between the A Street and Laurel Road interchanges				
Average Travel Speed (mph)	70	70	21	70
Delay Index /1/	1.00	1.00	3.33	1.00
Percent change from existing Delay Index	0% (1.00)	-34% (1.52)	+326% (1.02)	0% (1.00)
SR 160 between the SR 4 and Wilbur Avenue interchanges				
Average Travel Speed (mph)	70	70	70	70
Delay Index /1/	1.00	1.00	1.00	1.00

/1/ Delay Index is calculated as the free-flow speed (assumed to be 70 mph) divided by the average travel speed. The Traffic Service Objective defined by CCTA is a Delay Index of less than 2.5.

Source: Fehr & Peers, 2008.

Freeway Traffic Forecasts With Hillcrest Station Area Development, but Without Construction of the Phillips Lane Interchange at SR 4

Qualitative assessment and preliminary traffic model runs were conducted to determine when freeway operations will begin to exceed the adopted Delay Index standard, assuming that Phillips Lane Interchange is not built, and there is a phased development of the Hillcrest Station Area.

As indicated in the previous section, the Freeway Delay Index is expected to exceed the standard in 2035 with no Phillips Lane Interchange and no station area development except the eBART station and related parking. Traffic model runs were also conducted to determine the level of additional impact that the station area land development would have on the freeway if the Phillips Lane Interchange were not constructed. The model runs indicate that only about 60 percent of the expected peak hour traffic demand through the interchange area could be served in 2035; whereas, about 75 percent of the traffic was served with no station area development. In either case, the freeway system would breakdown.

Year 2020 was the basis of analysis to determine the implications of phased station area development. The transportation system assumptions included completion of the SR 4 Widening Project (including eBART with a Hillcrest Station), SR 4 Bypass Widening Project, Hillcrest Avenue Interchange Project, Slatten Ranch Road extension from Laurel Road to Hillcrest Avenue, and either the Viera Avenue or Phillips Lane extension to Slatten Ranch Road.

To represent year 2020 land use conditions, projected growth levels were obtained from the ABAG *Projections 2007* figures on residential and employment levels for year 2020. The land use forecasts for Antioch were scaled to ensure consistency with citywide 2020 land use totals from ABAG *P07*, assuming phased development in the Hillcrest Station Area. The level of development within the station area included: 650 housing units, 270,000 square feet of office, and 275,000 square feet of retail.

The year 2020 analysis indicates that traffic congestion through the Hillcrest Avenue Interchange will cause substantial vehicle queues that extend back onto the freeway mainline. These

conditions would be exacerbated if the assumed road improvements are not constructed; particularly the Hillcrest Avenue Interchange Improvements, Slatten Ranch Road extension from Laurel Road to Hillcrest Avenue, and either Viera Avenue or Phillips Lane extension to Slatten Ranch Road.

3.4-3 *Implementation of the proposed Specific Plan would generate additional Vehicle Miles Traveled (VMT). (Informational Purposes Only)*

This analysis is provided for informational purposes only. There is no significance criteria related to Vehicle Miles Traveled (VMT). The VMT analysis is the basis for analysis in the chapters regarding Air Quality and Climate Change.

The proposed Specific Plan VMT characteristics in year 2035 are presented in Table 3.4-17. The table also illustrates the 2035 conditions as compared to the citywide average for years 2007 and 2035. The values in Table 3.4-17 were obtained from the traffic forecasting model used in this study. While the Specific Plan would generate more VMT per capita than year 2007 levels, the citywide VMT per capita in year 2035 is expected to be 23.6, which is greater than the proposed plan which would generate 21.9 VMT per capita i.e., population plus employment.

Table 3.4-17 Vehicle Miles Traveled (VMT)

	Dwelling Units	*Population*	*Total Employment*	*VMT (Total)*	*VMT (per Capita /1/)*
Specific Plan	2,500	7,405	6,000	293,472	21.9
2007 City of Antioch	33,822	104,150	22,178	2,583,803	20.5
2035 City of Antioch	43,720	129,631	42,110	4,056,209	23.6

/1/ Vehicle Miles Traveled (VMT) per capita is calculated by dividing the total VMT by the sum of the population plus total employment.

Source: Fehr & Peers, 2008.

3.4-4 *Implementation of the proposed Specific Plan could increase transit demand. (Less than Significant)*

The East County Action Plan Traffic Service Objectives (TSOs) requires that transit ridership be increased by 25 percent between the years 2000 and 2010. Because implementation of the Specific Plan is not expected to begin until after the eBART project is completed in 2015, this TSO is not applicable. However, it can be assumed that increasing transit ridership will continue to be a priority for East County.

Buildout of the land uses envisioned with the proposed Specific Plan would result in additional demand for transit. The intensity of land uses in proximity to rail and bus transit should support new transit riders. BART needs to achieve a minimum number of riders to make the eBART service economically feasible. So, they adopted a 5,856 daily ridership threshold for the eBART service. BART has estimated that there will be about 10,100 daily riders by the year 2030 on the eBART corridor, well exceeding the adopted threshold. (*East Contra Costa County BART Extension Draft EIR*, September 2008). About 54 percent of these daily riders will be new transit users. Therefore the Transit Service Objective will be achieved.

As a "terminal" station, the Hillcrest Station is projected to serve 8,200 daily riders, many commuting by car or bus from East Contra Costa County. The transit-oriented development at the station will also generate transit riders. According to BART sources, daily ridership for development within one-half mile of the station can be estimated as 0.6 riders per household and 0.1 riders per job. Based on these assumptions, the land uses designated in the proposed Specific Plan will generate about 1,000 riders during the AM peak hour and the PM peak hour combined, and about 2,065 daily riders, about 25 percent of the daily total expected to use the station. The Specific Plan also contains policies supporting up to 2,600 parking spaces and a bus transit center to be built near the eBART station which will be used by the remaining 75 percent of riders that will either drive or use a bus to access the station.

The increase in transit demand will be served by the eBART line and station that will be constructed by eBART, and the bus service that will connect to the eBART station. Therefore the impact is less than significant.

Specific Plan Policies that Reduce Impact

The following proposed Specific Plan policies would reduce the impact on transit:

LU-3 Create a Transit Village in the western portion of the Hillcrest Station Area north of the Union Pacific Railroad right-of-way, with direct pedestrian, bicycle, bus transit, and automobile connections to the eBART station in the median of SR 4.

LU-24 Locate eBART parking so that it is accessible to passengers arriving by car, bus, bicycle, or on foot.

LU-25 Work with BART to ensure that at least 1,000 parking spaces are provided in close proximity to the eBART Station by 2015, and that 2,600 spaces are provided by 2035.

LU-27 Provide public bus facilities near each eBART station.

C-10 Construct a four-lane east-west road, Slatten Ranch Road, south of the Union Pacific Railroad from Hillcrest Avenue to SR 160 to serve the eBART Station and development between SR 4 and the Union Pacific right-of-way. Design this road consistent with the following criteria:

- Connect Sunset Drive west of Hillcrest Avenue with the Station Area;
- Accommodate easy and direct access for buses in and out of the eBART station; and
- Ensure that BART service can be extended to the east in or adjacent to the Union Pacific railroad right-of-way. Design of this corridor will need to be coordinated with Caltrans, Union Pacific Railroad, and BART.

C-35 The City shall continue working with BART, CCTA, Caltrans, and property owners to study design, funding, and construction options for the Hillcrest eBART station, including but not limited to the East Median Station, which is the City's preferred station location. The design and location of the station should be modified from the current Median Station plan to achieve the following goals:

- Provide a more direct pedestrian and bicycle route from the Transit Village pedestrian center to the eBART station, with a distance of no more than one-quarter mile, and the minimum number of grade changes;

- Provide shorter, more direct vehicular access between the Transit Village Area to the eBART station;
- Maximize developable land, especially properties with freeway visibility, and properties in the Transit Village Area; and
- Provide an attractive view from the eBART station, that includes a direct line of sight to the Transit Village, and screens the view of the PG&E station; and
- Maximize opportunities for shared parking between BART patrons and other land uses.

C-36 Develop a multi-modal transit center at the median eBART station that provides access to eBART, buses, taxies, and shuttles. Design the transit facilities to include:

- Bus transit center and approximately 8-12 bus bays (moved from the Hillcrest Park-and-Ride lot to the eBART Station parking area);
- Kiss-and-ride limited term parking area;
- Disabled parking;
- Shuttle pick up and drop off area; and,
- Safe and attractive pedestrian and bike crossings to the station.

C-37 Work with Tri-Delta Transit to minimize impacts to existing service while serving the Station Area.

C-38 Design arterials and arterial intersections, particularly near pedestrian-oriented streets, to accommodate transit services, including bus stops, pull-outs, and shelters.

Mitigation Measures

No mitigation measure required.

3.4-5 ***Implementation of the proposed Specific Plan would increase demand for parking. (Less than Significant)***

Development within the Specific Plan would be required to provide parking consistent with the zoning code for the City of Antioch, which historically has been sufficient to ensure adequate parking supply for development in Antioch. Policies within the plan do allow for modifying the zoning-required parking supply to recognize the shared parking opportunities within a mixed-use environment as well as opportunities to reduce parking demand due to proximity to transit. Any modifications can only be made when supported by an engineering study of similar developments in similar environments. Studies that recommend parking provisions different than the applicable zoning code must be reviewed and approved by the City.

Parking demand will also occur as a result of external sources to the Specific Plan development. Specifically, the eBART station located within the plan area will generate demand for parking. According to the the project description in the Draft EIR prepared for the eBART project, up to 1,000 parking spaces will be required to serve the demand generated by the eBART station within the plan area at opening day. The demand is then expected to increase to about 2,600 parking spaces in year 2030 if the eBART station within the plan area remains a terminus station.

The opening day eBART parking need (up to 1,000 spaces) can be accommodated within a mixed-use and transit-oriented development such as that envisioned with the Specific Plan. The Specific Plan allows for structured parking to be built in the future in the Freeway Area between SR 4 and the Union Pacific Railroad, which would likely occur on the site of the first phase surface parking lot with 1000 spaces. The Specific Plan would also allow for a second eBART station, which would disperse the 2,600 parking space need across two stations rather than one. In this manner, structured parking to accommodate the full compliment of eBART parking (2,600 spaces) could be distributed in parking lots and parking structures between the two stations.

Specific Plan Policies that Reduce Impact

The following proposed Specific Plan policies would reduce this impact:

LU-25 Work with BART to ensure that at least 1,000 parking spaces are provided in close proximity to the eBART Station by 2015, and that 2,600 spaces are provided by 2035.

C-24 Locate off-street parking behind buildings or in structures, to the maximum extent feasible. Do not locate parking between public streets and building entrances, except on commercial retail sites within the freeway area.

C-25 Maintain flexible parking standards that balance the need for parking with the broader Station Area goals of encouraging transit ridership, ridesharing, and nurturing the area's pedestrian appeal.

C-26 Distribute parking throughout the Station Area to help balance traffic flow on the street grid network.

C-27 Include on-street parking on collector and local streets, following detailed recommendations in Chapter 4, Urban Design.

C-28 Adopt specific parking standards for the Station Area. Consider some or all of the following strategies to prevent oversupply and encourage the use of alternate modes of transportation:

- Allow shared parking between uses with different peak periods of parking demand;
- Reduce minimum off-street parking requirements for multi-family and commercial developments;
- Adopt maximum off-street parking requirements;
- Allow credits for adjacent on-street spaces;
- Allow exemptions for small retail and dining establishments (e.g. less than 2,500 square feet) in pedestrian centers; and,
- Allow tandem parking in residential developments.

C-29 Work with property owners to emphasize shared parking arrangements where appropriate to maximize efficient use of parking resources.

C-30 Incentivize parking structures, rooftop parking, and underground parking, through flexibility in conditions of approval and in negotiations for any City financial participation in the development.

C-31 Require surface parking lots to be designed so that it is feasible to use them for other uses, such as farmers' markets or community events, without reducing the landscaping requirements.

C-32 Identify opportunities for parking pricing strategies. Work with property owners to price parking so as to discourage automobile trips that could be made by other modes.

C-34 Work with BART to identify funding sources for parking at the eBART stations, consistent with the following criteria:

- 1,000 spaces at the time eBART service begins; and,
- 2,600 spaces by 2030, if the Hillcrest Station continues to be the terminus station for the eBART service. These spaces may be developed in phases.

I-2 Prior to final approvals of land subdivisions or development projects in the Transit Village and Freeway Areas, work with BART on a comprehensive eBART parking plan, which defines how eBART parking requirements for 1,000 spaces will be met when the Hillcrest Station opens, and how future eBART parking requirements of 2600 spaces can be met without reducing the available developable land in the Transit Village and Freeway areas.

Mitigation Measures

None required.

3.4-6 ***Implementation of the proposed Specific Plan will increase bicycling and walking. (Less than Significant)***

The proposed Specific Plan would increase pedestrian and bicycle activity as well as vehicle traffic in and around the area. Pedestrian activity would increase commensurate with new roads, buildings, parking, and open space. The Specific Plan policies require the construction of an extensive network of pedestrian and bicycle facilities, including sidewalks, bridges, bicycle routes, and a multi-use trail separate from roads. All railroad crossings will be grade separated. The mixed-use environment over several hundred acres supports bicycling and walking as viable travel choices. Policies in the Specific Plan require facilities to be built in a manner that protects pedestrian and bicycle safety. Therefore the potential impacts on pedestrian and bicycle safety are less than significant.

Specific Plan Policies that Reduce Impact

In addition to the proposed circulation policies listed under Impact 3.1-1, the following Specific Plan policies reduce this impact:

C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish:

- Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and,
- Maximum block lengths of approximately 450 feet, or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block).

C-3 Design streets so that they incorporate medians, landscaping, sidewalks, street trees, travel lanes, bike lanes, and on-street parking, such that they:

- Are consistent with the desired pedestrian-oriented character and safety; and,
- Meet the needs of all users including drivers, pedestrians, persons with disabilities, bicyclists, and transit users.

C-39 Prioritize pedestrian and bicyclist safety at intersections and street crossings with measures such as:

- Contrasting and/or textured paving crosswalks;
- In-ground, blinking crosswalk lights; and,
- Pedestrian refuges and bulb-outs.

C-40 Implement a way-finding signage program for common destinations.

C-41 Require development projects to provide walking and biking routes directly to major destinations such as parks, pedestrian centers, and eBART stations.

C-42 Adopt minimum bicycle parking requirements for residential and commercial projects. Bicycle parking should be designed with the following criteria:

- Short-term parking should be visible from the main entrance of buildings.
- Long-term parking should be provided in secure, well-lighted areas.

C-43 Encourage employers to provide showers and lockers.

C-44 Limit the number of curb cuts allowed on each block face.

C-45 On pedestrian-oriented streets, design streets and sidewalks consistent with the provisions in Chapter 4, Urban Design, including:

- Tree wells or planter strips with trees between the sidewalk and parking;
- On-street parking between sidewalks and travel lanes;
- Pedestrian-scale street lights;
- Limited curb cuts that cross the pedestrian path of travel;
- Outdoor seating for restaurants and cafes;
- Projections into the right of way for awnings, canopies, pedestrian-oriented signs, bay windows, and other elements that enhance the pedestrian realm; and

C-46 Sidewalks should have at least a five-foot wide clear path of travel.

C-47 Provide bike routes throughout the Station Area, as illustrated in Figure 3-5.

- Class 1: Continuous multi-purpose trail along East Antioch Creek and the detention basins
- Class 2: Slatten Ranch Road, Phillips Lane, and Viera Avenue

C-48 Allow bicycle circulation on all local streets, to the extent feasible.

C-49 Design and implement a multi-use trail loop around the wetlands and East Antioch Creek. This loop should include at least two pedestrian crossings across the creek.

C-50 Provide multi-use trails that connect from East Antioch Creek to existing neighborhood parks north of the Station Area.

C-51 Provide at least two pedestrian and bicycle crossings across the railroad, at least one each in the Transit Village and the Town Center. If the Median Station is the selected eBART station location, provide a third pedestrian and bicycle crossing opposite the eBART station entrance, as shown in Figures 3-4 and 3-5.

OS-8 Create a linear public open space at least 25 feet wide around the wetlands and detention basins. Design the open space consistent with the following criteria:

- A multi-use trail 8-12 feet wide is provided around the perimeter of the 50-foot inner wetland buffer area;
- The trail connects to public streets, public parks, and plazas;
- At least two pedestrian and bike paths are available to cross the creek;
- At least one staging area with parking is provided adjacent to the trail in the Transit Village area and one in the Town Center area;
- Recreational facilities, such as seating, picnic tables, tot lots, and exercise areas or par course, are provided adjacent to the trail;
- Viewing platforms may be built to observe the natural areas; and
- If feasible, informational signage is provided so that the riparian habitat can used as an educational destination for local schools.

UD-27 Create pedestrian and bicycle routes from the pedestrian centers of the Transit Village and Town Center to the eBART station(s) that are direct, safe, attractive and well-lit. Minimize the travel time and travel distance, and minimize the number of road crossings and the elevation changes such as tunnels, bridges, and ramps.

UD-28 Incorporate bicycle and pedestrian facilities into the design of the railroad crossing at Viera Avenue and the design of Slatten Ranch Road, to create a comfortable and attractive pedestrian and bicycle route to eBART. If the railroad crossing is an undercrossing, minimize the width of the tunnel and maximize the daylight to the pedestrian/bicycle route.

UD-29 If the East Median station location is selected for the eBART station, create a good quality pedestrian/bicycle connection from the Transit Village pedestrian center to the eBART station entrance.

- Design the Viera Avenue undercrossing/overcrossing to provide a reasonably straight pedestrian/bicycle connection to the eBART station entrance.
- Incorporate a pedestrian path from the eBART station entrance to the Viera Avenue undercrossing (or overcrossing).
- Provide a signalized pedestrian/bicycle crossing at Slatten Ranch Road, or a pedestrian/bicycle bridge.
- The pedestrian and bicycle routes should be generally be consistent with the diagram shown in Figure 4-26: Pedestrian and Bicycle Route to eBART: East Median Station.

- Conduct further studies to optimize the design of the Viera Avenue under-crossing, the Slatten Ranch Road/Viera Avenue intersection, and the pedestrian connections, in order to achieve good quality connections, and at the same time minimize costs and storm drainage pumping facilities.

UD-30 If the Median Station location is selected for the eBART station, create a good quality pedestrian/bicycle connection from the Transit Village pedestrian center to the eBART station entrance.

- Build a pedestrian/bicycle crossing over the railroad line, in a location that is generally in a straight line with the eBART station entrance.
- Incorporate a pedestrian path from the eBART station entrance to the railroad crossing.
- Provide a signalized pedestrian/bicycle crossing at Slatten Ranch Road.
- The pedestrian and bicycle routes should be generally be consistent with the diagram shown in Figure 4-29: Pedestrian and Bicycle Route to eBART: Median Station.

Mitigation Measures

None required.

3.4-7 ***Construction of the Specific Plan elements would have temporary impacts on the environment if the project construction would substantially affect traffic flow, circulation, parking, and pedestrian safety. (Less than Significant)***

Construction activities include those associated with site preparation and building construction.

Site preparation includes all of the activities required to allow construction of the infrastructure and the individual parcels of the project. Major components would involve removal of existing structures, removal of contaminated soil material, deposition of clean fill, and grading. A variety of equipment would be required for site preparation including bulldozers, grading machines, cranes, and dump trucks, which would be responsible for the removal and deposition of cut and fill material on the site.

Infrastructure construction involves the utilities and the roads to support the building construction. Elements of infrastructure construction include laying storm drain and other utilities and grading/paving roads, sidewalks, and landscaping. Building construction involves the assembly of buildings on the site. Major elements of building construction would include driving piles to support the building foundation, constructing the building frame, pouring concrete, and completing the interior of each building.

Given the size of the project site, it is anticipated that the construction workers, vehicles, and equipment would be stored onsite. Therefore, the primary impacts to the circulation system would be related to construction vehicles traveling to and from the site, and the potential disruptions to normal vehicular, transit and bicycle/pedestrian flow on SR 4 and the local roads serving the project area that may result when major elements of the Specific Plan's roadway infrastructure are under construction.

Specific Plan policies require the preparation of Construction Traffic Management Plans by Project Sponsors, and thus this potential impact is less than significant.

Specific Plan Policies that Reduce Impact

The following Specific Plan policies reduce this impact:

C-23 Project sponsors shall develop a Construction Traffic Management Plan for City review and approval. The plan shall include at least the following items and requirements to reduce traffic congestion to the maximum extent feasible during construction:

- A set of comprehensive traffic control measures, including major truck trips and deliveries that avoid peak traffic hours, detour signs if required, lane closure procedures, sidewalk closure procedures, signs, cones for drivers, and designated construction access routes.
- Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur.
- Location of construction staging areas for materials, equipment, and vehicles (must be located on the project site).
- Identification of haul routes for movement of construction vehicles that minimize impacts on vehicular and pedestrian traffic, circulation and safety;
- Temporary construction fences to contain debris and material and to secure the site.
- Provisions for removal of trash generated by project construction activity.
- A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an onsite complaint manager.
- Provisions for monitoring surface streets used for truck routes so that any damage and debris attributable to the trucks can be identified and corrected.

Mitigation Measures

None required.

3.5 Climate Change and Energy Use

This section of the EIR analyzes quantitatively how implementation of the proposed Hillcrest Station Area Specific Plan may contribute to global climate change through greenhouse gas emissions related to transportation and electricity usage. In addition, the analysis qualitatively describes that there are no adverse impacts from sea level rise on the Planning Area. Because the State has not yet amended CEQA or the CEQA guidelines to include requirements for assessing climate change impacts, this climate change analysis has been prepared to reflect the most recent recommendations and guidance materials from the California Office of Planning and Research, the California Air Resources Board, the Attorney General, and other responsible agencies.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Global Climate Change

Global climate change (GCC) is currently one of the most important and widely debated scientific, economic, and political issues in the United States. GCC refers to a change in the average weather of the earth that may be measured by wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the distant past, such as during previous ice ages. The rate of temperature change has typically been incremental, with warming and cooling occurring over the course of thousands of years. In the past 10,000 years the earth has experienced incremental warming as glaciers retreated across the globe. However, scientists have observed an unprecedented increase in the rate of warming over the past 150 years, roughly coinciding with the global industrial revolution.

Although GCC is now widely accepted as a concept, the extent and speed of change to be expected, and the exact contribution from human sources, remains in debate. Nonetheless, the world's leading climate scientists, the Intergovernmental Panel on Climate Change (IPCC), have reached consensus that global climate change is "very likely" caused by humans, and that hotter temperatures and rising sea levels will continue for centuries no matter how much humans control their future emissions. In particular, human influences have:

- *very likely* contributed to sea level rise and increased storm surge during the latter half of the 20th century;
- *likely* contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns;
- *likely* increased temperatures of extreme hot nights, cold nights and cold days;
- *more likely than not* increased risk of heat waves, area affected by drought since the 1970s, and frequency of heavy precipitation events. (IPCC, November 2007)

The IPCC predicts that global mean temperature increase from 1990-2100 could range from 2.0 to 11.5 degrees Fahrenheit, with the most likely scenario between 3.2 and 7.1 degrees. The same report projects a sea level rise of 7 to 23 inches by the end of the century, with a greater rise possible depending on the rate of polar ice sheet melting.

According to the California Climate Action Team (CCAT), accelerating GCC has the potential to cause a number of adverse impacts in California, including but not limited to: a shrinking Sierra snowpack that would threaten the state's water supply; public health threats caused by higher temperatures and more smog; damage to agriculture and forests due to reduced water storage capacity, rising temperatures, increasing salt water intrusion, flooding, and pest infestations; critical habitat modification and destruction; eroding coastlines; increased wildfire risk; and increased electricity demand. (CCAT, April 2006) These impacts have and will continue to have considerable costs associated with them.

While all of these impacts may be felt to some extent in the Bay Area and the City of Antioch, of particular concern are high temperatures and the negative impacts on air quality, and water quality and water supply issues. Recent studies indicate that hot days correlate with poor air quality days, and air pollution is contributing to more annual deaths and cases of respiratory illness and asthma (Jacobson, 2008). In other areas of the Bay Area, sea level rise and the resulting potential for intermittent flooding and gradual inundation is a concern that must be addressed.

Greenhouse Gases

Gases that that trap heat in the Earth's atmosphere are called greenhouse gases (GHGs). These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that enters Earth's atmosphere from space is absorbed by the Earth's surface. The Earth reflects this radiation back toward space, but GHGs absorb some of the radiation. As a result, radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere. Without natural GHGs, the Earth's surface would be about 61°F cooler. (CCAT, April 2006) This phenomenon is known as the greenhouse effect. However, many scientists believe that emissions from human activities—such as electricity generation, vehicle emissions, and even farming and forestry practices—have elevated the concentration of GHGs in the atmosphere beyond naturally-occurring concentrations, contributing to the larger process of global climate change. The six primary GHGs are:

- **Carbon dioxide (CO_2),** emitted as a result of fossil fuel combustion, with contributions from cement manufacture;
- **Methane (CH_4),** produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion;
- **Nitrous oxide (N_2O),** typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- **Hydrofluorocarbons (HFCs),** primarily used as refrigerants;
- **Perfluorocarbons (PFCs),** originally introduced as alternatives to ozone depleting substances and typically emitted as by-products of industrial and manufacturing processes; and
- **Sulfur hexafluoride (SF_6),** primarily used in electrical transmission and distribution systems.

Though there are other emissions, such as diesel particulate matter, that can contribute to global warming, these six are identified explicitly in California legislation and litigation as being of primary concern. GHGs have varying potentials to trap heat in the atmosphere, known as global

warming potential (GWP), and atmospheric lifetimes. GWP ranges from 1 (carbon dioxide) to 23,900 (sulfur hexafluoride). GHG emissions with a higher GWP have a greater global warming effect on a molecule-by-molecule basis. For example, one ton of CH_4 has the same contribution to the greenhouse effect as approximately 21 tons of CO_2. (California Climate Action Registry, 2008) GWP is alternatively described as "carbon dioxide equivalents", or CO_2e. The parameter "atmospheric lifetime" describes how long it takes to restore the system to equilibrium following an increase in the concentration of a GHG in the atmosphere. Atmospheric lifetimes of GHGs range from tens to thousands of years.

California and Bay Area GHG Emissions

GHG emissions contributing to GCC are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. (CEC, December 2006) The State of California alone produces about 2 percent of the entire world's GHG emissions, with major sources here including fossil fuel consumption from transportation (41 percent), industry (23 percent), electricity production (20 percent), and agricultural and forestry (8 percent). Much like nations around the world, California government is looking at options and opportunities for drastically reducing GHG emissions with the hope of thereby delaying, mitigating, or preventing at least some of the anticipated impacts of GCC on California communities.

The Global Warming Solutions Act of 2006 (AB 32) required that the Air Resources Board determine the statewide greenhouse gas emissions level in 1990. Based on its 1990-2004 inventory work, ARB staff recommended an amount of 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) as the total statewide greenhouse gas 1990 emissions level and 2020 emissions limit. The Board approved the 2020 limit on December 6, 2007. (CARB, 2008) This would be approximately 9.7 $MTCO_2e$ per capita, based on the Department of Finance's projection of state population of about 44 million persons.

Table 3.5-1 California 2020 GHG Emissions Goal

Total Emissions	427,000,000
2020 Population	44,135,923
Emissions per Capita	9.7

Source: ARB, 2007; California Department of Finance, 2007; Dyett & Bhatia, 2008.

Furthermore, local and regional agencies in the Bay Area have taken steps to measure, quantify, evaluate, and regulate their contributions to GHG emissions and global warming. For example, the cities of San Francisco, San Jose, and Palo Alto, the East Bay Municipal Utility District, UC Berkeley and Stanford University, and numerous other water and power utilities, public agencies, foundations, and individual businesses are members of the Climate Action Registry, a private non-profit organization originally formed by the State of California that serves as a voluntary greenhouse gas (GHG) registry to protect and promote early actions to reduce GHG emissions by organizations. Additionally, a number of cities and counties in the Bay Area have already developed or are in the processing of completing their own climate/greenhouse gas reduction action plans and inventories.

In 2006, the Bay Area Air Quality Management District (BAAQMD) completed a baseline inventory of GHG emissions for the year 2002. According to that inventory, 85.4 million tons of

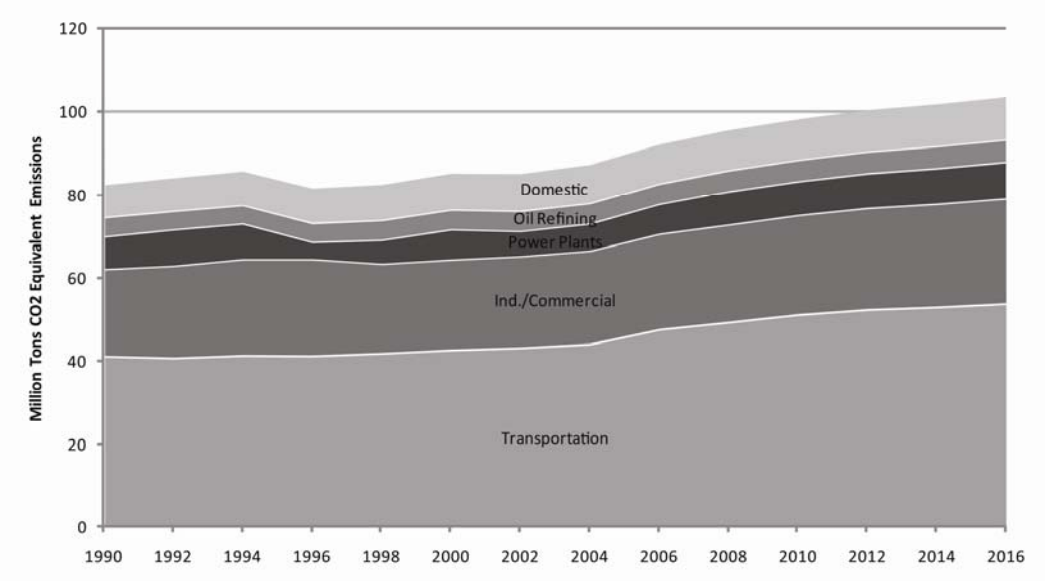
CO_2e greenhouse gases were emitted in the Bay Area that year (BAAQMD, November 2006). The Bay Area's transportation sector contributes 50 percent of the CO_2e emissions, followed by industrial and commercial sources (26 percent), domestic fuel consumption (11 percent), electricity generation at power plants (7 percent), and crude oil refining (6 percent). This is equivalent to approximately 12.6 metric tons of GHG emissions per person per year. Absent policy changes, Bay Area GHG emissions are expected to grow at a rate of 1.4 percent a year due to population growth and economic expansion. (BAAQMD, November 2006) Economic activity variations and the fraction of electric power generation in the region will cause year-to-year fluctuations in the emissions trends.

Table 3.5-2 2002 Bay Area CO_2e Emissions by Pollutant

Pollutant	*CO_2e (Million Tons/Year)*	*Percent of Total*
Carbon Dioxide	77	90%
Methane	4	5%
Nitrous Oxide	4	5%
HFC, PFC, SF_6	1	<1%
Total	86	100

Source: Bay Area Air Quality Management District, 2006

Figure 3.5-1 Bay Area Greenhouse Gas Emissions Trends by Major Source



Source: Bay Area Air Quality Management District, 2006

Contra Costa County GHG Emissions

According to the BAAQMD GHG Inventory, Contra Costa County generated more GHG emissions, 30 percent of the total, than any other county in the nine-county region. In 2008, Contra Costa County published a baseline inventory of GHG emissions for the base year 2005, as shown in Table 3.5-3 (Contra Costa County, June 2008). For countywide emissions, the inventory evaluated energy use, vehicle transportation, and waste disposal for cities and unincorporated areas in the County. Countywide data for residential, commercial, and industrial energy use was provided by PG&E. The commercial/industrial emissions are based exclusively on energy use and do not include emissions from refinery operations. Transportation data was provided by the Metropolitan Transportation Commission (MTC). Emissions calculations for land-filled waste assume an 85 percent methane recovery factor.

Table 3.5-3 Contra Costa Countywide GHG Emissions (2005)

Emissions Source	*$MTCO_2e$* [1]	*Percent of County Total*	*Emissions per Capita*
Incorporated Areas			
Residential Energy Use	1,308,216	11%	1.51
Commercial/Industrial/Direct Access Energy Use	2,530,030	21%	2.93
Transportation	3,569,319	29%	4.13
Land-filled Waste	153,043	1%	0.18
Incorporated Subtotal	**7,560,608**	**61%**	**8.75**
Unincorporated Areas			
Residential Energy Use	279,439	2%	1.75
Commercial/Industrial/Direct Access Energy Use	3,500,768	28%	21.93
Transportation	972,754	8%	6.09
Land-filled Waste	22,335	0%	0.14
Unincorporated Subtotal	**4,775,296**	**39%**	**29.91**
County Totals			
Residential Energy Use	1,587,655	13%	1.55
Commercial/Industrial/Direct Access Energy Use	6,030,798	49%	5.89
Transportation	4,542,073	37%	4.44
Land-filled Waste	175,378	1%	0.17
COUNTY TOTAL	**12,335,904**	**100%**	**12.05**
2050 County Goal (80 percent less)	2,467,181		1.36

1. $MTCO_2e$, metric tons carbon dioxide equivalent, describes the number of metric tons of carbon dioxide that would have the same climate change potential as the actual assortment of greenhouse gases.

Source: Contra Costa County Greenhouse Gas Emissions Inventory Report, June 2008; Dyett & Bhatia, 2008.

The inventory includes a more detailed analysis of County operations such as: County building energy use, streetlight energy use, water and sewage energy use, fuel use by the municipal vehicle fleet, and land-filled waste disposal from County facilities and operations. However, data for individual cities or water and sewer districts have not been analyzed separately. The inventory does not account for construction emissions.

The total county-wide GHG emissions in 2005 was approximately 12.3 million metric tons, which is equivalent to approximately 12.0 metric tons per capita per year. For the County as a whole, commercial and industrial energy use accounts for almost half of the total emissions (49 percent), followed by transportation (37 percent), residential energy use (13 percent), and land-filled waste (1 percent). The major oil refineries located in unincorporated Contra Costa County account for a large part of the greenhouse gas emissions from the commercial and industrial sectors (Contra Costa County, June 2008).

Countywide Actions to Reduce GHG Emissions

Contra Costa County adopted the long-term reduction target set by the U.S. Cool Counties Climate Stabilization Declaration in October 2007. This declaration calls for the County to work closely with local, state, and federal governments and other leaders to *develop a regional plan to reduce county geographical GHG emissions to 80 percent below current levels by 2050.* Achieving this goal would require the County to reduce its total GHG emissions from 12.3 million metric tons to less than 2.5 million metric tons. Based on a project countywide population of more than 1.8 million, the per capita emissions would need to be reduced to 1.4 metric tons of carbon dioxide equivalent emissions by 2050. To achieve this goal, the County would need to reduce its emissions by 3.5 percent or 214,538 metric tons of carbon dioxide equivalent emissions each year.

The County has implemented and planned many countywide GHG reduction measures. These measures include efforts such as establishing urban growth boundaries, encouraging mixed-use development to reduce travel distances, regulating wood burning appliances, and using methane from landfills to generate electricity, to name a few. The GHG Inventory Report also identified numerous measures for the County to consider as part of the Climate Action Plan.

City of Antioch GHG Emissions

Using the per capita average GHG emission factors for the County incorporated areas from 2005, the City of Antioch would have produced about 881,000 metric tons of GHG emissions. This is based on the 2005 population of 100,714, as estimated by the California Department of Finance, and the assumption that there are no oil refineries in Antioch. This equates to 8.75 metric tons carbon dioxide equivalent per capita.

Table 3.5-4 City of Antioch Estimated GHG Emissions (2005)

Emissions Source	*Emissions per Capita Factor*	*$MTCO_2e$* [1]
Residential Energy Use	1.51	152,078
Commercial/Industrial/Direct Access Energy Use	2.93	295,092
Transportation	4.13	415,949
Land-filled Waste	0.18	18,129
City Total	**8.75**	**881,248**

Note: Emissions estimates based on 2005 population of 100,714 and the emissions per capita factors for the Contra Costa County incorporated areas.

1. $MTCO_2e$, metric tons carbon dioxide equivalent, describes the number of metric tons of carbon dioxide that would have the same climate change potential as the actual assortment of greenhouse gases.

Source: Contra Costa County Greenhouse Gas Emissions Inventory Report, June 2008; Dyett & Bhatia, 2008.

Sea Level Rise

Sea level rise as a consequence of global warming has received considerable attention in the scientific community and the media. It is widely believed that higher global temperatures will lead to the melting of polar ice caps, which in turn will cause global sea levels to rise. The IPCC and the 2006 California Climate Action Team Report project that mean sea level will rise between 12 and 36 inches by the year 2100. Sea level rise models indicate that an 11.8 inch rise in sea level would shift the 100-year storm surge-induced flood event to once every 10 years. Historical records show that sea level in San Francisco Bay has risen seven inches over the past 150 years.

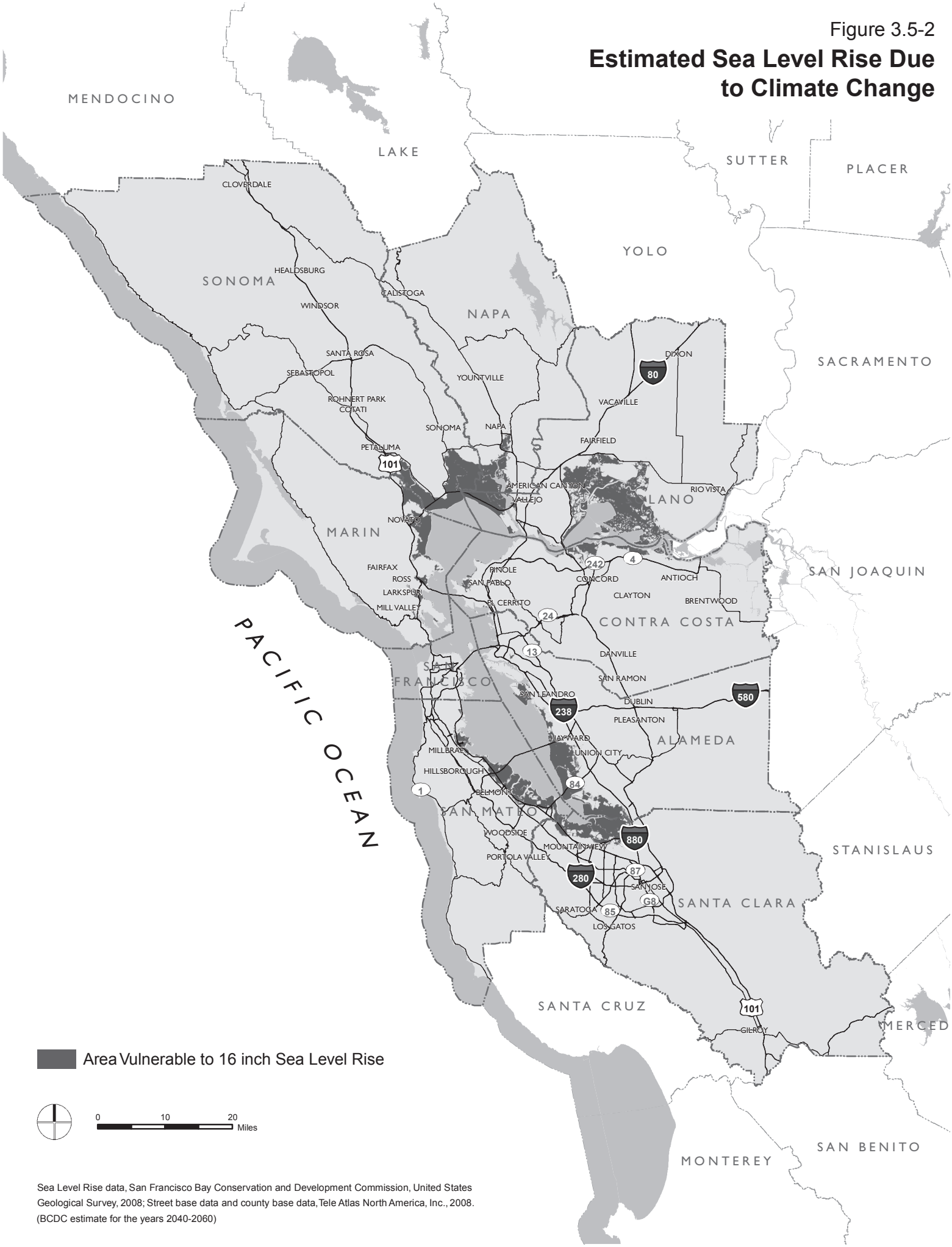
The San Francisco Bay Conservation and Development Commission (BCDC) has conducted an analysis for the Bay Area, which include U.S. Geological Survey (USGS) data and maps that generally reflect the low-lying areas of the shoreline that would be subject to tidal inundation and flooding should a one meter sea level rise occur by 2100. (BCDC, 2007) These maps indicate that the Planning Area is not within the areas impacted by sea level rise.

Energy Use

Pacific Gas & Electric (PG&E) currently provides electric services and natural gas to Antioch homes and businesses PG&E is an investor-owned utility which is regulated by the California Public Utilities Commission (CPUC). PG&E generates electricity primarily from natural gas, nuclear, and hydroelectric sources, but also from coal, wind, geothermal, and biomass sources. The combustion of fossil fuels to produce electricity generates greenhouse gases including carbon dioxide and, to a lesser extent, nitrous oxide and methane. According to the California Energy Commission, in 2006, Contra Costa County consumed a total of 8,511 million kWh of electricity, approximately 8,293 kWh per capita.

Figure 3.5-2

Estimated Sea Level Rise Due to Climate Change



Sea Level Rise data, San Francisco Bay Conservation and Development Commission, United States Geological Survey, 2008; Street base data and county base data, Tele Atlas North America, Inc., 2008. (BCDC estimate for the years 2040-2060)

REGULATORY SETTING

The regulations listed below reflect a partial list of actions the federal and state governments have taken to address global climate change. To date, the State has not imposed any requirements on local agencies to help achieve GHG emissions reductions.

Definitions

Distributed Generation

Distributed generation encompasses various small-scale types of electrical generation, such as micro-turbines, fuel cells, photovoltaics, cogeneration (reuse of waste heat) and other sources of electrical power that can be effectively located within office parks, industrial facilities, and other large buildings.

Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change (IPCC) is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) and by the United Nations Environment Programme (UNEP). Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts, and options for adaptation and mitigation.

Federal Regulations

Global Change Research Act (1990)

In 1990, Congress passed and the President signed Public Law 101-606, the Global Change Research Act. The purpose of the legislation was: "…to require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions towards international protocols in global change research, and for other purposes." To that end, the Global Change Research Information Office (GCRIO) was established in 1991 (it began formal operation in 1993) to serve as a clearinghouse of information. The Act requires a report to Congress every four years on the environmental, economic, health and safety consequences of climate change; however, the first and only one of these reports to-date, the *National Assessment on Climate Change*, was not published until 2000. In February 2004, operational responsibility for GCRIO shifted to the U.S. Climate Change Science Program.

Massachusetts v. EPA (2007)

In this U.S. Supreme Court case, 12 states, 3 cities, and 13 environmental groups filed suit that the U.S. Environmental Protection Agency (EPA) should be required to regulate carbon dioxide and other greenhouse gases as pollutants under the federal Clean Air Act. In April 2007, the U.S. Supreme Court found that the EPA has a statutory authority to formulate standards and regulations to address greenhouse gases, which it historically has not done. To date, the EPA still has not taken any new action. It is unclear what effect the action would take, in particular on California communities as they may already be subject to more stringent regulations.

Energy Independence and Security Act of 2007

In December 2007, President Bush signed the Energy Independence and Security Act of 2007 to move the U.S. toward greater energy independence and security. This energy bill increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022. It also tightens the Corporate Average Fuel Economy (CAFE) standards that regulate the average fuel economy in the vehicles produced by each major automaker. The current CAFE standard for cars, set in 1984, requires manufacturers to achieve an average of 27.5 miles per gallon, while a new standard for light trucks and heavier SUVs was adopted in 2006 that would require new vehicles to achieve 24 mpg by 2011 (this standard was later challenged in court). This energy bill requires that these standards be increased such that, by 2020, the new cars and light trucks sold each year deliver a combined fleet average of 35 miles per gallon. A transition schedule for achieving these new standards was issued for comment in April 2008.

State Regulations

AB 1493 (Chapter 200, Statutes 2002)

AB 1493 (Pavley) amended Health and Safety Code sections 42823 and 43018.5 requiring the California Air Resources Board (CARB) to develop and adopt regulations that achieve maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California. The regulations prescribed by AB 1493 may not take effect prior to January 1, 2006, and they apply only to 2009 and later model years.

In September 2004, pursuant to AB 1493, the CARB approved regulations to reduce greenhouse gas emissions from new motor vehicles. Under the regulation, one manufacturer fleet average emission standard is established for passenger cars and the lightest trucks, and a separate manufacturer fleet average emission standard is established for heavier trucks. The regulation takes effect on January 1, 2006 and sets near-term emission standards, phased in from 2009 through 2012, and mid-term emission standards, phased in from 2013 through 2016. CARB calculates that the AB 1493 vehicle requirements would cumulatively produce 41 percent more GHG reductions by 2020 compared to the new federal CAFÉ standard in the Energy Independence and Security Act of 2007 (above). CARB has estimated that these regulations would reduce GHG emissions from these light-duty vehicles 18 percent by 2020 and 27 percent by 2030. (CARB, 2004) However, EPA has refused to grant a waiver that would allow California to implement these standards, and California has challenged this action in federal court.

Executive Order S-20-04 (Gov. Schwarzenegger, December 2004)

Executive Order S-20-04 commits the State to aggressive action to increase building energy efficiency, since it has been determined that commercial buildings use 36 percent of the state's electricity and account for a large percentage of greenhouse gas emissions, raw materials use and waste. In addition to requiring state-owned building to be retrofit to be more energy efficient, this EO requires the California Energy Commission to undertake all actions within its authority to increase efficiency by 20 percent by 2015, compared to Titles 20 and 24 non-residential standards adopted in 2003.

Executive Order S-3-05 (Gov. Schwarzenegger, June 2005)

The Governor of California signed Executive Order S-3-05 on June 1, 2005. The Order recognizes California's vulnerability to climate change, noting that increasing temperatures could potentially reduce snow pack in the Sierra Nevada, which is a primary source of the State's water supply. Additionally, according to this Order, climate change could influence human health, coastal habitats, microclimates, and agricultural yield. The Order set the greenhouse gas reduction targets for California: by 2010, reduce GHG emissions to 2000 levels; by 2020 reduce GHG emissions to 1990 levels; by 2050 reduce GHG emissions to 80 percent below 1990 levels.

California Global Warming Solutions Act of 2006 (AB 32)

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act (Health and Safety Code Section 38500 et. seq.). The Act requires the reduction of statewide GHG emissions to 1990 levels by the year 2020. This change, which is equivalent to a 25 percent reduction from current emission levels, will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012.

AB 32 also directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources and address GHG emissions from vehicles. CARB has stated that the regulatory requirements for stationary sources will be first applied to electricity power generation and utilities, petrochemical refining, cement manufacturing, and industrial/commercial combustion. The second group of target industries will include oil and gas production/distribution, transportation, landfills and other GHG-intensive industrial processes.

Senate Bill 1368 (Chapter 598, Statutes of 2006)

Senate Bill (SB) 1368, signed by Governor Schwarzenegger in September 2006, required the California Public Utilities Commission (PUC) to establish a GHG emissions performance standard for "baseload" generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly-owned utilities by June 30, 2007. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet or exceed the standards set by the PUC and the CEC. In January 2007, the PUC adopted an interim performance standard for new long-term commitments (1,100 pounds of CO_2 per megawatt-hour), and in May 2007, the CEC approved regulations that match the PUC standard.

Executive Order S-01-07 (Gov. Schwarzenegger, January 2007)

In January 2008, Governor Schwarzenegger established a Low-Carbon Fuel Standard by Executive Order. Executive Order S-01-07 calls for a statewide goal to be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 ("2020 Target"), and that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. Further, it directs CARB to determine if an LCFS can be adopted as a discrete early action measure pursuant to AB 32, and if so, consider the adoption of a LCFS by June 30, 2007, pursuant to Health and Safety Code Section 38560.5. The LCFS applies to all refiners, blenders, producers or importers ("Providers") of transportation fuels in California, will be measured on a full fuels cycle basis, and may be met through market-based methods by which Providers exceeding the performance required by a LCFS shall receive credits that may be applied to future obligations or traded to Providers not meeting the LCFS.

In June 2007, CARB approved the LCFS as a Discrete Early Action item under AB 32. It is expected that the regulatory process at CARB to implement the new standard will be completed no later than December 2008.

SB 97 (Chapter 185, Statutes 2007)

Senate Bill (SB) 97 directs the Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. The Resources Agency is required to certify and adopt amendments to the Guidelines implementing the California Environmental Quality Act ("CEQA Guidelines") on or before January 1, 2010. These new CEQA Guidelines will provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents. In the interim, the OPR offered informal guidance regarding steps lead agencies should take to address climate change in their CEQA documents. (Governor's Office of Planning and Research, 2008)

SB 375 (Chapter 728, Statutes of 2008)

On September 30, 2008, Governor Schwarzenegger signed Senate Bill (SB) 375 into law. This legislation links transportation and land use planning with the CEQA process to help achieve the GHG emission reduction targets set by AB 32. Regional transportation planning agencies are required to include a sustainable community strategy (SCS) in regional transportation plans. The SCS must contain a planned growth scenario that is integrated with the transportation network and policies in such a way that it is feasible to achieve AB 32 goals on a regional level. SB 375 also identifies new CEQA exemptions and streamlining for projects that are consistent with the SCS and qualify as Transportation Priority Projects (TPP). TPPs must meet three requirements: 1) contain at least 50 percent residential use; commercial use must have floor area ratio (FAR) of not less than 0.75; 2) have a minimum net density of 20 units per acre; and 3) be located within one-half mile of a major transit stop or high quality transit corridor included in the regional transportation plan.

Executive Order (EO) S-13-08

On November 14, 2008, Governor Schwarzenegger issued Executive Order (EO) S-13-08 directing state agencies to plan for sea level rise and climate change impacts. There are four key actions in the EO including: (1) initiate California's first statewide climate change adaptation strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies by early 2009; (2) request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts; (3) issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects; and (4) initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

California Attorney General Actions

As the chief law enforcement officer of the State, charged by the Constitution to protect the public interest and the State's natural resources, California Attorney General Edmund G. Brown Jr. is committed to doing everything in his power to ensure that California meets its greenhouse gas reduction targets[1]. Examples of the Office of Attorney General's efforts include suing companies in the power industry and the auto industry for their contributions to global warming and writing letters or submitting oral testimony in over 30 different CEQA environmental review processes for city general plans, county general plans, regional transportation plans, and specific projects throughout California.

Regional and Local Regulations

Joint Policy Committee

In the Bay Area, the Joint Policy Committee (JPC) coordinates the regional planning efforts of the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District (BAAQMD), the Bay Conservation and Development Commission (BCDC) and MTC. In fall 2006, the JPC commenced a six-month program to study the issue of climate change and to recommend an initial set of actions to be pursued jointly by the four regional agencies. The study recommends that the regional agencies build their Joint Climate Protection Strategy in service of this key goal: "To be a model for California, the nation and the world." It then organizes initial actions by six strategy elements: establish priorities, increase public awareness and motivate action, provide assistance, reduce unnecessary driving, prepare to adapt, and break old habits. (Joint Policy Committee, 2007)

Contra Costa County

Contra Costa County adopted the long-term reduction target set by the U.S. Cool Counties Climate Stabilization Declaration in October 2007. This declaration calls for the County to work closely with local, state, and federal governments and other leaders to develop a regional plan to reduce county geographical GHG emissions to 80 percent below current levels, 13.7 million metric tons of GHG emissions, by 2050.

Antioch General Plan

10.6.2 Resource Management: Air Quality Policies

a. Require development projects to minimize the generation of particulate emissions during construction through implementation of the dust abatement actions outlined in the CEQA Handbook of the Bay Area Air Quality Management District.

[1] The Attorney General global warming web portal may be found at http://ag.ca.gov/globalwarming/ The portal contains information on global warming generally, impacts in California, and documentation of the comments, speeches, op-eds, testimony, and litigation actions he has taken to support AB 32 goals.

b. Require developers of large residential and non-residential projects to participate in programs and to take measures to improve traffic flow and/or reduce vehicle trips resulting in decreased vehicular emissions. Examples of such efforts may include, but are not limited to the following.

   - Development of mixed use projects, facilitating pedestrian and bicycle transportation and permitting consolidation of vehicular trips.
   - Installation of transit improvements and amenities, including dedicated bus turnouts and sufficient rights-of-way for transit movement, bus shelters, and pedestrian easy access to transit.
   - Provision of bicycle and pedestrian facilities, including bicycle lanes and pedestrian walkways connecting residential areas with neighborhood commercial centers, recreational facilities, schools, and other public areas.
   - Contributions for off-site mitigation for transit use.
   - Provision of charging stations for electric vehicles within large employment-generating and retail developments.

c. Budget for purchase of clean fuel vehicles, including electrical and hybrid vehicles where appropriate, and, if feasible, purchasing natural gas vehicles as diesel powered vehicles are replaced.

d. Support and facilitate employer-based trip reduction programs by recognizing such programs in environmental mitigation measures for traffic and air quality impacts where their ongoing implementation can be ensured and their effectiveness can be monitored.

e. As part of the development review process for non-residential development, require the incorporation of best available technologies to mitigate air quality impacts.

f. Provide physical separations between (1) proposed new industries having the potential for emitting toxic air contaminants and (2) existing and proposed sensitive receptors (e.g., residential areas, schools, and hospitals).

g. Require new wood burning stoves and fireplaces to comply with EPA and BAAQMD approved standards.

10.8.2 Resource Management: Energy Resource Policies

a. Continue to implement Title 24 of the State Building Code, and provide incentives to encourage architects and builders to exceed the energy efficiency standards of Title 24 through increased use of passive, solar design and day-lighting.

b. Promote the use of site design, landscaping, and solar orientation to decrease the need for summer cooling and winter heating.

c. Where feasible, incorporate recycled materials in new construction.

d. Encourage the installation of energy efficient lighting, reduced thermostat settings, and elimination of unnecessary lighting in public facilities.

e. Facilitate the installation of environmentally acceptable forms of distributed generation, where such systems can be safely and economically provided.

f. Maintain City physical facilities so as to ensure that optimum energy conservation is achieved.

g. Promote purchasing of energy-efficient equipment based on a fair return on investment, and use energy-savings estimates as one basis for purchasing decisions for major energy-using devices.

h. Promote coordination of new public facilities with transit services and non-motorized transportation facilities, including bicycles, and design structures to enhance transit, bicycle, and pedestrian use.

i. The City shall review all development plans prior to approval to guarantee that energy conservation and efficiency standards of Title 24 are met and are incorporated into the design of the future proposed project.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

As of the date of this analysis, neither the BAAQMD or CARB, nor any other state or federal agency has approved thresholds of significance or an emission rate criterion for GHG emissions. Until such requirements are issued, lead agencies responsible for complying with CEQA are using a variety of resources available to guide environmental review.

The most current and comprehensive guidance document available at this time is the California Air Pollution Control Officers Association (CAPCOA) white paper entitled *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, published in January 2008. This white paper discusses evaluating and addressing greenhouse gas emissions under CEQA in order to provide a common platform of information and tools to support local governments. While not intended to dictate the manner in which a lead agency chooses to address GHGs, this paper provides a coherent look at the tools and techniques available, and suggests possible advantages and disadvantages of each analytical approach. The CAPCOA white paper discusses three basic paths lead agencies could take when contemplating CEQA thresholds of significance for GHG emissions (CAPCOA, 2008):

1. A “no threshold” approach, wherein the lead agency determines there are sufficient reasons to not specify a universal threshold for GHG emissions, and instead requires analysis on a project-by-project basis;
2. A “zero emissions” threshold, wherein the lead agency finds that any increase in GHG emissions is potentially significant under CEQA and therefore all projects under the lead agency must quantify and mitigate GHG emissions regardless of the size of the project, or prepare EIRs to disclose the unmitigable significant impact; or
3. A “non-zero” threshold, wherein the lead agency decides that there are certain GHG emission sources that are so small they will not contribute substantially to the global GHG problem, and sets thresholds of significance, or a de minimus value for cumulative impacts.

This EIR use a criterion based on a "zero emissions" threshold as a comprehensive approach to GHG impact analysis that evaluates the change in existing conditions as well as the role of the proposed Plan in the regional cumulative impact. As such, the County has the only adopted standard or goal related to GHG emissions at this time; therefore, the implementation of the proposed Hillcrest Station Area Specific Plan will have a significant impact if it would:

- Prevent the reduction of countywide greenhouse gas emissions to 80 percent below current levels by 2050.

To evaluate the potential impact on energy resources, the following criteria has been used:

- A significant impact would occur if the project would result in a substantial increase in energy consumption to the extent that energy generation capacity is exceeded.

METHODOLOGY AND ASSUMPTIONS

The 2035 climate change and energy analysis assesses cumulative impacts; it assumes the implementation of the proposed Specific Plan as part of the overall regional growth as projected by the Association of Bay Area Governments in 2007. The analysis of greenhouse gas emissions is based on the Contra Costa County baseline inventory of GHG emissions for the base year 2005.

Per capita emissions were calculated based on the County population. Table 3.5-5 shows the per capita emissions for incorporated areas, unincorporated areas, and the County as a whole. The averages for County incorporated areas were used to project emissions for the City of Antioch and the Planning Area.

Table 3.5-5 Contra Costa County 2005 Average Annual GHG Emissions Per Capita (Metric Tons)

	Incorporated Areas	*Unincorporated Areas*	*County Total*
Residential Energy Use	1.51	1.75	1.55
Commercial/Industrial/Direct Access Energy Use	2.93	21.93	5.89
Transportation	4.13	6.09	4.44
Land-filled Waste	0.18	0.14	0.17
Total Average Per Capita GHG Emissions	**8.75**	**29.91**	**12.05**

Source: Contra Costa County Greenhouse Gas Emissions Inventory Report, June 2008; Dyett & Bhatia, 2008

County 2050 GHG Goal

The Contra Costa County's goal is to develop a regional plan to reduce county geographical GHG emissions to 80 percent below current levels by 2050. Achieving this goal would require the County to reduce its total GHG emissions from 12.3 million metric tons to less than 2.5 million metric tons. Based on a project countywide population of more than 1.8 million, the per capita emissions would need to be reduced to 1.4 metric tons of carbon dioxide equivalent emissions by 2050. To achieve this goal, the County would need to reduce its emissions by 3.5 percent or 214,538 metric tons of carbon dioxide equivalent emissions each year.

Table 3.5-6 County GHG Projections to Achieve 2050 Goal

Year	Population	Percent Reduction (3.5 percent per year)	Emissions per Capita	Unit Reduction (214,538 $MTCO_2e$ per year)	Emissions per Capita
2005	1,023,400	12,335,904	12.05	12,335,904	12.05
2010	1,061,900	10,315,912	9.71	11,048,679	10.40
2015	1,107,300	8,626,692	7.79	9,975,992	9.01
2020	1,157,000	7,214,080	6.24	8,903,305	7.70
2025	1,208,200	6,032,782	4.99	7,830,617	6.48
2030	1,255,300	5,044,920	4.02	6,757,930	5.38
2035	1,300,600	4,218,820	3.24	5,685,243	4.37
2040 *	1,609,257	4,070,599	2.53	4,612,555	2.87
2050 *	1,812,242	2,467,181	1.36	2,467,181	1.36

* All population projections from ABAG 2007, except for 2040 and 2050 projections which are from California Department of Finance, 2007.

Source: ABAG, 2007; CA Department of Finance, 2007; Dyett & Bhatia, 2008.

GHG Emissions Reduction Factors

Based on adopted and proposed state and local regulations, GHG emissions are estimated to decrease. Reduction factors have been used to depict the relative influence of state regulations on GHG emissions. Implementation of the AB 1493 (Pavley) regulations could reduce GHG emissions from transportation by 22.9 percent. Implementation of Executive Order S-20-04 is intended to make non-residential buildings 20 percent more efficient (Governor Schwarzenegger, 2004). No GHG emission reduction factors are applied to residential energy use or land-filled waste.

Fuel Efficiency

In September 2004, pursuant to AB 1493 (Pavley), the CARB approved regulations to reduce greenhouse gas emissions from new motor vehicles. Under the regulation, one manufacturer fleet average emission standard is established for passenger cars and the lightest trucks, and a separate manufacturer fleet average emission standard is established for heavier trucks. The regulation took effect on January 1, 2006.

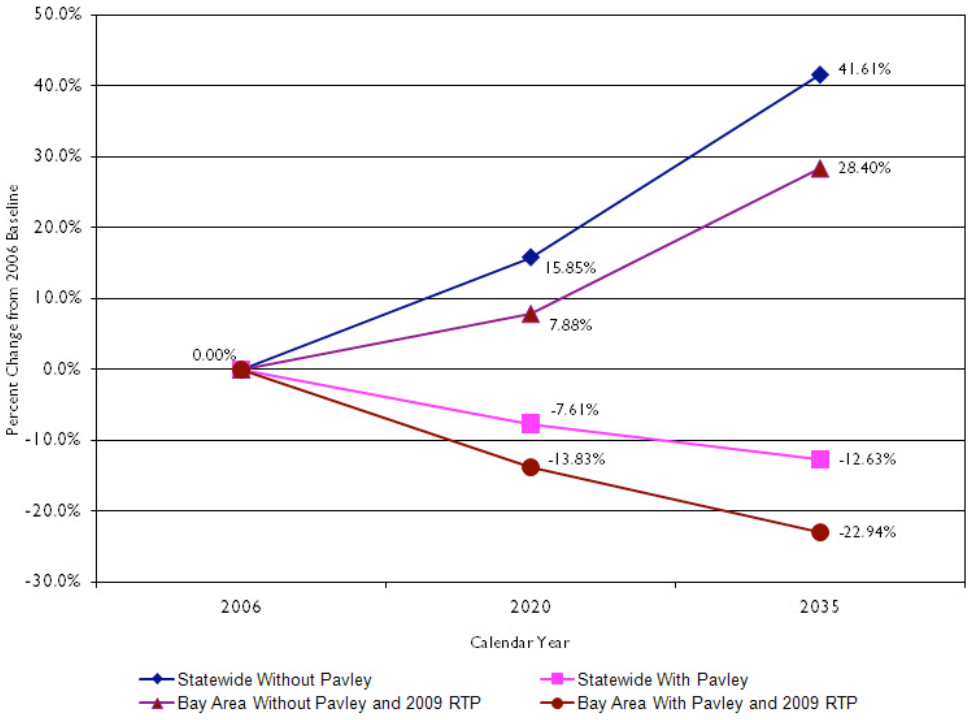
- Phase 1: set near-term emission standards, phased in from 2009 through 2012, and mid-term emission standards, phased in from 2013 through 2016
- Phase 2: The CARB intends to extend the existing requirements to obtain further reductions in the 2017 to 2020 timeframe (referred to as Pavley Phase 2 rules).

The CARB has included both Pavley Phase 1 and 2 rules in its Climate Change Proposed Scoping Plan (October 2008), pursuant to the Global Warming Solutions Act of 2006 (AB 32), which outlines the State's strategy to achieve 2020 greenhouse gas emission reductions. While EPA has refused to grant a waiver that would allow California to implement these standards, and California has challenged this action in federal court, the President-elect Obama administration has indicated it would grant the waiver.

The CARB calculates that in calendar year 2016, the Pavley Phase 1 rules will reduce California's GHG emissions by 16.4 million metric tons of carbon dioxide equivalents, and by 2020, Pavley Phase 2 would reduce emissions by 31.7 million metric tons of carbon dioxide equivalents. Further, the AB 1493 new vehicle requirements would cumulatively produce 45 percent more GHG reductions by 2020 compared to the new federal CAFE standard in the Energy Independence and Security Act of 2007 (above). (CARB, 2008)

The estimated benefits from the Pavley Phase 1 and 2 rules for California and the Bay Area are represented in the graph below. Without Pavley rules, both state and regional CO_2 emissions would increase steadily between now and 2035 as VMT increases with population growth; with Pavley rules, CO_2 emissions are projected to decrease between now and 2035. This decrease in regional 2035 CO_2 emissions compared to current levels is in large part a result of technological changes expected to reduce CO_2 emissions per VMT. The regulations would reduce climate change emissions from the light duty passenger vehicle fleet by 12.6 percent statewide and 22.9 percent in the Bay Area in 2035 compared to 2006. (MTC, December 2008).

Figure 3.5-3 On-Road Carbon Dioxide Emissions Reductions with Pavley Rules



Note: Calendar year 2020 percent changes for the Bay Area are indirectly calculated.

Source: California Air Resources Board and Metropolitan Transportation Commission (2008)

It is likely that regional carbon dioxide emissions from motor vehicles will increase and peak around year 2010 because the region will experience increases in VMT, and Pavley Phase 1 will not yet be fully implemented (it only applies to 2009 and later model year vehicles). After 2010, regional CO_2 emissions are expected to decline as the Pavley Phase 1 rules are implemented, and will continue to decline in later years as Pavley Phase 2 rules are implemented. Development

within the Planning Area and related vehicle trips are not expected to begin until after 2015 when the eBART project is complete. Therefore, the fuel efficiency improvements due to the Pavley rules should be in effect for the implementation of the proposed Plan.

Non-Residential Building Energy Efficiency

Executive Order (EO) S-20-04 commits the State to aggressive action to increase building energy efficiency, commercial buildings use 36 percent of the state's electricity and account for a large percentage of greenhouse gas emissions, raw materials use and waste. In addition to requiring state-owned building to be retrofit to be more energy efficient, this EO requires the California Energy Commission to undertake all actions within its authority to increase efficiency by 20 percent by 2015, compared to Titles 20 and 24 non-residential standards adopted in 2003. Therefore, a 20 percent reduction factor has been applied to the commercial/industrial sector energy use.

SUMMARY OF IMPACTS

Greenhouse Gas Emissions

The GHG emissions from the buildout of the proposed Specific Plan are estimated to be more than 36,000 metric tons of carbon dioxide equivalent emissions in 2035. Based on the anticipated population in the Planning Area, this would be about 7.2 metric tons of CO_2e per person.

The proposed Plan implements best practices in integrated land use and circulation planning and smart growth, as well as green building and waste reduction strategies. Project sponsors will be required to implement existing federal, state, and regional programs aimed at reducing total GHG emissions, in addition to the proposed Specific Plan objectives, principles, and policies. The VMT per capita will be lower within the Planning Area than in the City as a whole. At a minimum the GHG emissions per capita will be about 30 percent less than the countywide per capita emissions in 2035. In addition, the projected population within the Planning Area will only account for 0.4 percent of the County's total population in 2035. Therefore, it is unlikely that the implementation of the proposed Hillcrest Station Area Specific Plan will make a considerable contribution to whether the County is able to reach its 2050 GHG emission goal. Therefore, even though the cumulative impact for the region is significant, the project's contribution is less than considerable.

Energy Use

If per capita energy use were to remain constant, based on the 2006 CEC estimates, new development in the Planning Area would consume approximately 41 million kWh in 2035. This is approximately 0.4 percent of the County's total projected energy consumption. Proposed Specific Plan policies intend to ensure that new buildings are energy efficient, which may reduce the average per capita consumption for the area. According to PG&E, the anticipated energy demand would not exceed the energy generation capacity. Therefore, there is no adverse impact in terms of energy use and supply and therefore, energy use is not analyzed further.

IMPACTS AND MITIGATION MEASURES

3.5-1 *Implementation of the proposed Specific Plan would contribute to an increase in countywide greenhouse gas emissions. (Cumulatively Significant, Project Contribution Less than Considerable)*

It is reasonable to conclude that global climate change is a significant cumulative impact, as the scientific community has acknowledged its detrimental effects on ecosystems and human communities, and it is caused by the cumulative greenhouse gas emissions from human activities across the globe and over many decades. Furthermore, as global climate change is accelerated by greenhouse gases, any additional greenhouse gas emissions beyond what exists today in the atmosphere can generally be considered to contribute to this significant cumulative impact. However, for the purposes of this EIR, this analysis needs to make a determination about whether the implementation of the proposed Specific Plan makes a *cumulatively considerable contribution* to the overall cumulative impact.

County GHG Emissions

ABAG projects that Contra Costa County will have a 2035 population of 1,300,600, which is a 27 percent increase in total population (ABAG, 2007). If no GHG emissions reduction measures are implemented and the per capita emissions factors remain the same as in 2005, the County would produce approximately 15.7 million metric tons of carbon dioxide equivalent GHG emissions in 2035. With the implementation of adopted State regulations, the countywide emissions could be reduced to 13.7 million $MTCO_2e$, which is an 11 percent increase over existing levels. These reduction factors help to reduce GHG emissions per capita by more than 12 percent. This analysis is presented in Table 3.5-7. As footnoted in the table, this estimation only applies the commercial building energy efficiency factor to the estimated incorporated areas because power plants and other large industrial uses are the primary energy users in the unincorporated areas. Building efficiency would not account for a significant reduction in total energy use in power plants.

As indicated previously, the County needs to reduce its emissions by an annual average of 3.5 percent to reach its 2050 goal. In 2035, the total County emissions should be between 4.22 million and 5.7 million $MTCO_2e$, or between 3.2 and 4.4 $MTCO_2e$ per person, as shown in Table 3.5-6. The current statewide emission reduction regulations will not be sufficient to help the County reach its goal. Additional measures will need to be taken to reduce countywide GHG emissions. Therefore, the cumulative impact of regional growth in Contra Costa County is significant.

Table 3.5-7 Estimated Countywide Metric Tons GHG Emissions

	2005 $MTCO_2e$	*2035 $MTCO_2e$* [1]	*2035 $MTCO_2e$ with State Regulation Reduction Factors*	*Percent Change from Existing*
Residential Energy Use	1,587,655	2,017,690	2,017,690	27%
Commercial/Industrial/Direct Access Energy Use	6,030,798	7,664,311	7,021,247 [2]	16%
Transportation	4,542,073	5,772,347	4,450,480 [3]	-2%
Land-filled Waste	175,378	222,881	222,881	27%
Total GHG Emissions	**12,335,904**	**15,677,230**	**13,712,298**	**11%**
GHG Emissions per Capita	12.1	12.1	10.5	-12.5%

1. Based on ABAG 2007 County population projection for 2035 of 1,300,600 persons.
2. State Regulation Reduction Factors: - 20 percent building non-residential building efficiency applied to commercial/industrial/direct access based on implementation of Executive Order S-20-04. (This was applied only to the estimate population in incorporated areas in the County, because power plants and other large industrial uses are the primary energy users in the unincorporated areas. Building efficiency would not account for a significant reduction in total energy use.)
3. State Regulation Reduction Factors: - 22.9 percent fuel efficiency applied to transportation based on MTC's analysis of implementation of AB 1493 (Pavley)

Source: Contra Costa County, Dyett & Bhatia, 2008

Project GHG Emissions

Based on the 2005 estimates of County per capita GHG emissions, the projected buildout population of 5,000 persons in the Planning Area would contribute a total of 43,800 metric tons of carbon dioxide equivalent GHG emissions. If adopted State regulations related to reducing GHG emissions are implemented or enforced, the estimated total GHG emissions from the Planning Area would be approximately 36,140 metric tons. As described previously the state regulation reduction factors used in this study are: a) 20 percent non-residential building energy efficiency factor applied to commercial/industrial/direct access emissions based on implementation of Executive Order S-20-04; and b) 22.9 percent fuel efficiency factor applied to transportation emissions based on MTC's analysis of implementation of AB 1493 (Pavley). With these reduction factors, the estimated per capita emissions would be 7.2 $MTCO_2e$, which is more than 30 percent less than the countywide per capita emissions. However, the per capita emissions in the Planning Area of 7.2 is still more than the emissions level of 1.36 required to meet the County's 2050 goal, as seen in Table 3.5-6.

Table 3.5-8 Estimated Planning Area Metric Tons of GHG Emissions

Type of Energy Use	*County Incorporated Area 2005 per Capita $MTCO_2e$*	*2035 $MTCO_2e$* [1]	*2035 $MTCO_2e$ with State Regulation Reduction Factors*
Residential	1.51	7,600	7,600
Commercial/Industrial/ Direct Access	2.93	14,600	11,680 [2]
Transportation	4.13	20,700	15,960 [3]
Land-filled Waste	0.18	900	900
Total GHG Emissions		**43,800**	**36,140**
GHG Emissions per Capita		8.8	7.2

1. Based on projected population of 5,000 persons in the Planning Area.
2. State Regulation Reduction Factors: - 20 percent building non-residential building efficiency applied to commercial/industrial/direct access based on implementation of Executive Order S-20-04.
3. State Regulation Reduction Factors: - 22.9 percent fuel efficiency applied to transportation based on MTC's analysis of implementation of AB 1493 (Pavley)

Source: Dyett & Bhatia, 2008

The Contra Costa County GHG Emissions Inventory does not provide a complete breakdown of all emissions in the county, so this estimation of emissions generated by development within the Planning Area is quantified at a programmatic level, and may be understated. More detailed analysis will need to be completed to identify specific emissions generated from industrial processes, water and wastewater conveyance and treatment, and construction.

It is feasible that the emissions in the Planning Area may be lower than estimated in Table 3.5-8. In addition to complying with existing federal, state, and regional programs aimed at reducing total GHG emissions, the proposed objectives, principles, and policies in the Hillcrest Station Area Specific Plan reflect the current best practices in smart growth planning. The proposed Plan provides consumers with a variety of transportation choices and a variety of housing choices and opportunities in a location identified by regional planning agencies as a potential infill development site. The proposed Plan provides the framework for compact transit-oriented development with a mix of land uses. The travel demand model demonstrated that the VMT per capita within the Planning Area will be 7 percent less than the citywide VMT per capita at buildout.

Specific Plan Objectives and Principles that Reduce Impact

While the overall impact of the proposed Plan on GHG emissions cannot be accurately quantified, the efforts to minimize GHG emissions by prioritizing VMT reductions and the integration of land use and circulation planning are discussed qualitatively. As indicated, transportation is responsible for more than a third of the GHG emissions in Contra Costa County, and more than half of the Bay Area GHG emissions. The State of California is currently trying to adopt new fuel efficiency measures which will reduce the emissions from each vehicle, but reducing the vehicle miles traveled (VMT) has the potential to decrease regional GHG emissions significantly. MTC Travel Demand Forecasts indicate that each day Bay Area residents are making trips to work, shopping and other errands, for recreation and social occasions, school, and other non-home based trips. Land use planning can help to reduce VMT and subsequent GHG emissions by providing a mix of

uses near homes and employment, increasing densities and reducing sprawl, connecting streets, providing better access to jobs, transit, and services.

The eBART extension project is providing a new transit option to East Contra Costa County. In order to support the public investment by providing land uses that generate ridership near the proposed Hillcrest Station, the proposed Plan integrates land use and transportation in order to reduce VMT.

The following principles were used to guide the layout of the land use plan:

- Create an East County employment center.
- Provide a mix of uses that supports transit ridership.
- Ensure that vibrant pedestrian-oriented retail/restaurant/entertainment centers are the focus of the Transit Village and Town Center.
- Integrate new development with existing uses and neighborhoods.
- Limit sensitive receptors' exposure to noise and air quality emissions.
- Preserve the natural features and functions of East Antioch Creek, while enhancing its recreational uses.
- Reduce total vehicle miles traveled and regional greenhouse gas emissions.

The proposed Circulation Plan is based on the following principles:

- Provide access to all parts of the Hillcrest Station Area with a walkable, fine-grain street grid.
- Minimize impacts of Station Area development on existing residential development adjacent to the project area.
- Reduce total vehicle miles traveled and regional greenhouse gas emissions.
- Support rail and bus transit.
- Emphasize pedestrian, cyclist, and transit-rider connections to the eBART station and major destinations.
- Provide parking for BART and development as efficiently as possible.

The environmental protection and hazard mitigation principles include:

- Preserve biological resources associated with East Antioch Creek and other biological resource areas, including wetlands, wildlife habitat, and all plant and animal species that are threatened or endangered.
- Preserve natural environmental processes that protect health and safety, such as water filtration through soil that protects water quality, and riparian vegetation that minimizes erosion and flooding.
- Minimize the use of energy resources so as to ensure a sustainable long-term supply.
- Minimize air pollution.
- Remediate soil and groundwater contamination.

- Minimize the potential for loss of life, injury, property damage, and economic and social disruption resulting from natural and manmade hazards, including earthquakes, floods, landslides, and liquefaction.

It is the objective of the Specific Plan to ensure that within the Planning Area, at buildout there will be a wide mix of uses that provide a range of residential and employment options, as well as convenient retail and services. Most of the homes and jobs will be within walking distance of bus and eBART transit options, as well as a well-connected local and regional road network. The area has been designated by the City and regional planning agencies as a potential infill site since it is surrounded by existing residential neighborhoods, plus the residential densities will be higher on average than most of the City of Antioch; thereby providing an alternative to sprawl. Based on these factors, the travel model shows that the VMT per capita in the Planning Area will be approximately 13 percent less than residents in other parts of the City of Antioch.

Land use and transportation planning are not the only avenues to reducing greenhouse gas emissions. Green building standards can reduce the amount of electricity and water used in and by building. Building and urban design standards can also be enhanced to facilitate "greener" behavior. For example, if space is made available for recycling and composting receptacles, one obstacle can be removed, and total land-filled waste can be reduced. If sidewalks and delineated bike paths are available and well-lit, residents may be more willing to walk or bike for daily errands.

Emissions from construction vehicles and operations are regulated by the regional air quality management district, BAAQMD. BAAQMD's approach to analyses of construction air quality impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. The Bay Area 2005 Ozone Strategy incorporates construction emissions into the on-road and off-road mobile sources analysis. The Antioch General Plan and Municipal Code require that all new construction comply with BAAQMD's dust control measures. All projects implemented under the proposed Plan would have to comply with these measures.

Specific Plan Policies that Reduce Impact

In addition to the General Plan policies, the following proposed Specific Plan policies which support energy efficiency and on-site generation, reducing VMT, and reducing waste will help to reduce the total greenhouse gas emissions from development in the Hillcrest Station Area:

County and State Greenhouse Gas Reduction Initiatives

EH-31 The City shall continue to work with the county, and other local, state, and federal governments, to develop a regional plan to reduce county geographical GHG emissions to 80 percent below current levels by 2050.

I-19 The Transit Village Master Plan should ensure that the area north of the UP railroad within 0.5 miles of the eBART station complies with the criteria for transit priority projects, as defined by California Senate Bill 375 (and any subsequent updates.)

I-20 The Town Center Master Plan should ensure that the area north of East Antioch Creek within 0.5 miles of either the Phillips Lane eBART station or shuttle stop for the Hillcrest eBART Station complies with the criteria for transit priority projects, as defined by California Senate Bill 375 (and any subsequent updates.)

Energy Efficiency

EH-32 Projects that receive financial assistance from the City or the Redevelopment Agency, including but not limited to assistance with public infrastructure, shall demonstrate the incorporation of energy efficiency measures beyond the minimum standards of Title 24 and the use of alternative energy sources such as solar power.

EH-33 All electrical appliances installed in development projects in the Hillcrest Station Area shall be Energy Star rated.

EH-34 All projects shall demonstrate that recycled materials have been incorporated into new construction.

EH-35 Non-residential projects shall meet whichever standard is lower:

- The current energy efficiency standard at the time that the development application is submitted, or
- A 20 percent reduction in energy from the 2003 Title 24 Standards, consistent with Executive Order S-20-2004 issued by Governor Schwarzenegger.

EH-36 Locate, orient, and shade the building, where feasible, as follows:

- Provide exterior shade for south-facing windows during the peak cooling season.
- Provide vertical shading against direct solar gain and glare due to low altitude sun angles for east- and west-facing windows.
- When site and location permit, orient the building with the long sides facing north and south.
- Protect the building from thermal loss, drafts, and degradation of the building envelope caused by wind and wind-driven materials such as dust, sand, and leaves with building orientation and landscape features.
- Wherever possible, use vegetation to shade buildings to limit direct solar gain and glare.

Policies that Contribute to Reducing VMT: Connected Streets

C-1 Create a connected street network of arterials and collectors that connects with existing local and regional roadways, and provides circulation throughout the Station Area.

C-2 Create a connected network of local streets appropriate for a mixed use, pedestrian-oriented environment that extends throughout the Hillcrest Station Area. The network should establish:

- Blocks that are two to four acres in size to facilitate direct and easy pedestrian access between different land uses and destinations; and,
- Maximum block lengths of approximately 450 feet, or 600 feet where a mid-block pedestrian connection is provided (measured on the longest side of the block).

C-6 Minimize cul-de-sacs to the maximum extent possible. Where cul-de-sacs are necessary due to barriers such as freeways and detention basins:

- Provide at least one pedestrian and bicycle path at the circular end in order to connect to other streets and trails, to allow emergency vehicle access when warranted and to minimize response times for emergency access; and,
- Consider designing cul-de-sacs with a planted cul-de-sac island to limit the amount of pavement and increase stormwater management opportunities.

C-8 All applications for master plans, subdivisions, and development projects shall indicate how streets are connected to existing local and regional roadways, and how a connected network of streets is created throughout the Hillcrest Station Area.

Policies that Contribute to Reducing VMT: Mixed Uses

LU-3 Create a Transit Village in the western portion of the Hillcrest Station Area north of the Union Pacific Railroad right-of-way, with direct pedestrian, bicycle, bus transit, and automobile connections to the eBART station in the median of SR 4.

LU-8 Develop a Town Center in the eastern portion of the Hillcrest Station Area that incorporates retail, entertainment, hospitality, and residential uses in a "lifestyle center" or other pedestrian-oriented format.

LU-14 Allow compatible retail, restaurant, personal service, and other commercial uses within the Office TOD district. These uses must be on the ground floor and publicly accessible.

LU-16 Up to 100 square feet of compatible retail, restaurant, personal service, office, and other commercial uses per residential unit is allowed within the Residential TOD district. These uses must be on the ground floor or second floor, and must be publicly accessible.

LU-4 Locate high-density residential development within a half-mile walk from the eBART station.

- A range of housing types may be included in a development project, some of which may be as low as 10 units per acre provided the total project meets the minimum density standard.
- Residential units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts.

Policies that Contribute to Reducing VMT: Support Alternative Modes

LU-24 Locate eBART parking so that it is accessible to passengers arriving by car, bus, bicycle, or on foot.

LU-27 Provide public bus facilities near each eBART station.

C-3 Design streets so that they incorporate medians, landscaping, sidewalks, street trees, travel lanes, bike lanes, and on-street parking, such that they:

- Are consistent with the desired pedestrian-oriented character and safety; and,
- Meet the needs of all users including drivers, pedestrians, persons with disabilities, bicyclists, and transit users.

C-36 Develop a multi-modal transit center at the median eBART station that provides access to eBART, buses, taxies, and shuttles. Design the transit facilities to include:

- Bus transit center and approximately 8-12 bus bays (moved from the Hillcrest Park-and-Ride lot to the eBART Station parking area);
- Kiss-and-ride limited term parking area;
- Disabled parking;
- Shuttle pick up and drop off area; and,
- Safe and attractive pedestrian and bike crossings to the station.

C-38 Design arterials and arterial intersections, particularly near pedestrian-oriented streets, to accommodate transit services, including bus stops, pull-outs, and shelters.

C-39 Prioritize pedestrian and bicyclist safety at intersections and street crossings with measures such as:

- Contrasting and/or textured paving crosswalks;
- In-ground, blinking crosswalk lights; and,
- Pedestrian refuges and bulb-outs.

C-41 Require development projects to provide walking and biking routes directly to major destinations such as parks, pedestrian centers, and eBART stations.

C-42 Adopt minimum bicycle parking requirements for residential and commercial projects. Bicycle parking should be designed with the following criteria:

- Short-term parking should be visible from the main entrance of buildings.
- Long-term parking should be provided in secure, well-lighted areas.

C-46 Sidewalks should have at least a five-foot wide clear path of travel.

C-47 Provide bike routes throughout the Station Area, as illustrated in Figure 3-5.

- Class 1: Continuous multi-purpose trail along East Antioch Creek and the detention basins
- Class 2: Slatten Ranch Road, Phillips Lane, and Viera Avenue

C-48 Allow bicycle circulation on all local streets, to the extent feasible.

C-49 Design and implement a multi-use trail loop around the wetlands and East Antioch Creek. This loop should include at least two pedestrian crossings across the creek.

C-50 Provide multi-use trails that connect from East Antioch Creek to existing neighborhood parks north of the Station Area.

Policies that Contribute to Reducing VMT: Transportation Demand Management

C-22 Apply a Transportation Demand Management (TDM) program that reduces single-occupant vehicle trips to development exceeding 25,000 square feet of non-residential space. Components of TDM programs could include:

- Contributions to urban design projects, such as:
  - Bicycle parking, both short- and long-term, located in appropriate places; and,
  - Direct routes to transit (station, shuttle, or bus) and other key destinations that are well-lit and designed for pedestrian comfort.
- Employer-based programs, such as:
  - Carpool and vanpool ride-matching services;
  - Designated employer TDM contact;
  - Guaranteed ride home for transit users and car/vanpoolers;
  - Transit subsidies for employees;
  - Flexible work schedules, shortened work weeks, or options to telecommute;
  - Information campaigns using brochures, boards/kiosks, or other communication outlets; and,
  - Employer provided showers and lockers.
- Meeting or exceeding project design standards, such as:
  - Free and preferential parking for carpools, vanpools, low-emission vehicles, and car-share vehicles;
  - Passenger loading zones; and,
  - Bicycle- and pedestrian- friendly site planning and building design.

Reducing Land-filled Waste

UT-11 All new development shall participate in all solid waste source reduction and diversion programs in effect at the time of the issuance of building permits.

UT-12 All projects in the Hillcrest Station Area shall comply with the City's Construction and Demolition Debris recycling regulations by preparing a Waste Management Plan and diverting at least 50 percent of all construction and demolition debris.

UT-13 Restaurants should use on-site composting systems if a food waste recycling program is not available.

UT-14 Trees, stumps, vegetation, and soils associated with excavation and land clearing shall be composted, recycled, or reused, except when soils may be contaminated with hazardous materials, or where other conditions make this infeasible as determined by the City.

Summary of Significance

The proposed Plan implements best practices in integrated land use and circulation planning and smart growth, as well as green building and waste reduction strategies. Project sponsors will be required to implement existing federal, state, and regional programs aimed at reducing total GHG emissions, in addition to the proposed Specific Plan objectives, principles, and policies. The VMT per capita will be lower within the Planning Area than in the City as a whole. At a minimum the GHG emissions per capita will be about 30 percent less than the countywide per capita emissions in 2035. In addition, the projected population within the Planning Area will only account for 0.4 percent of the County's total population in 2035. Therefore, it is unlikely that the implementation of the proposed Hillcrest Station Area Specific Plan will not make a considerable contribution to whether the County is able to reach its 2050 GHG emission goal. Therefore, even though the cumulative impact for the region is still significant, the project's contribution is less than considerable.

Mitigation Measures

No mitigation measures required.

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3.6 Cultural Resources

This section presents the environmental setting and impact assessment for cultural resources in the Hillcrest Station Planning Area.

ENVIRONMENTAL SETTING

Cultural resources are defined as prehistoric and historic sites, structures, and districts, or any other physical evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. For analysis purposes, cultural resources may be categorized into three groups: archaeological resources, historic resources, and contemporary Native American resources. Paleontological resources, while not generally considered a "cultural resource," are afforded protection under CEQA,[1] and as such are evaluated in this section of the EIR. The following cultural, historical, and ethnographic information is extracted from a variety of sources including the City of Antioch General Plan, the City of Antioch General Plan Draft EIR, studies prepared by Holman and Associates and an overview document prepared by the Northwest Information Center at Sonoma State University.

PHYSICAL SETTING

The Planning Area is depicted by the Antioch South and Antioch North USGS 7.5' topographic quadrangles.

Prehistoric Context

The prehistoric occupation of Central California can be interpreted using the Paleo-Archaic-Emergent chronological sequence. (Fredrickson, 1974) The sequence consists of three broad periods: The Paleo-Indian period (10,000 – 6,000 BC); the Archaic period consisting of the Lower Archaic (6,000 – 3,000 BC), Middle Archaic (3,000 – 1,000 BC, and Upper Archaic (1,000 BC – AD 500); and the Emergent period (AD 500 – 1800). The entry and spread of people into California dates to the Paleo-Indian period and human occupation in what is now Contra Costa County dates to the Middle Archaic period. (Moratto, 1984) The cultural patterns relevant to the project area include the Windmiller Pattern and Berkeley Pattern during the Archaic period and the Augustine Pattern during the Emergent period.

The Windmiller Pattern was characterized by small communities of hunters and gatherers who moved seasonally. Material attributes typical of the Windmiller Pattern include large leaf-shaped and stemmed projectile points, westerly oriented extended burials with grave offerings or burial goods such as red ocher, and a distinctive variety of shell beads and charmstones. (Ember & Peregrine, 2001) Subsistence was based on hunting large animals including deer and elk, along with smaller game animals such as water fowl. Fishing also occurred along with the gathering of nuts and fruits.

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[1] Public Resources Code (PRC) Section 5097.5 provides for the protection of cultural and paleontological resources. PRC section 5097.5 prohibits the removal, destruction, injury, or defacement of archaeological and paleontological features on any lands under the jurisdiction of state or local authorities.

The Berkeley Pattern was characterized by larger communities with more permanent settlement patterns. Material attributes typical of the Berkeley Pattern include projectile points with distinctive diagonal flaking across their faces, flexed position burials with burial ornaments such as shell beads, and an extensive bone tool industry. During this Pattern, a heavy reliance was developed on acorns which were used throughout the year as a staple food. (Ember & Peregrine, 2001) Food was also obtained through a combination of hunting, fishing, and gathering. Tools were more diverse than the Windmiller Pattern, and included specialized fish spears and hunting gear along with bone and ground-stone tools.

The Augustine Pattern was characterized by large sedentary communities. Material attributes typical of the Augustine Pattern include large spear points, often with serrated edges, and small arrow points, bone harpoons, ceramics and coiled basketry, and flexed position burials, and evidence of the practice of cremation. (Ember & Peregrine, 2001) Hunting and gathering was practiced broadly and important technological innovations include the bow and arrow and shaped mortars and pestles. This late prehistoric pattern was ancestral to the Miwok who occupied central California at the time of Spanish contact. (Fiedel, 1992)

Anthropologists have classified the linguistic and cultural group of the Antioch area as Bay Miwok people. (Antioch Historical Society, 2005) Antioch was also once occupied by Julpun and Ompin groups; other groups such as the Ohlones, Patwins, and Coast and Plains Miwoks were also known to come into the area for gatherings. The Bay Miwok constructed conical dwellings framed with wooden poles and covered with plants, grasses, fronds, or bark. Their diet consisted of a wide variety of wild plants including acorns, greens, nuts, berries, seeds, and roots. They also ate fish and hunted elk, deer, fowl and small game. The Bay Miwok used a variety of hunting tools made from stone and bone while their most important weapon was the bow and arrow. The main political unit of the Bay Miwok was the triblet, a sovereign nation composed of several lineages or settlements of intermarried families. (Pritzker, 2000)

Prehistoric Archeological Resources

The majority of archeological resource locations in the San Francisco Bay Area region are associated with either Native American or Euroamerican occupation of the area. Prehistoric cultural resources in the San Francisco Bay region tend to be located near sources of fresh water, along the bayshore, and in the hills of Contra Costa County. There are no prehistoric archaeological sites recorded within the Planning Area. No archaeological resources were observed during a walking survey conducted in July 2007 as part of a background report prepared by Holman & Associates. A subsequent report prepared by Holman & Associates in October 2008, after mechanical subsurface presence/absence testing of the Planning Area, concluded that there is at best a low to moderate possibility that construction related to earthmoving will affect buried prehistoric archeological resources. (Holman and Associates, October 2008)

Historic Context

In the 1770s the Spanish conducted a series of expeditions into Contra Costa County to find new mission sites. The earliest land exploration of the Antioch area was conducted in March 1772 by Don Pedro Fages and Padre Juan Crespi. (Antioch Historical Society, 2005) Spanish missions were established in the San Francisco Bay Area, beginning with Mission San Francisco in 1776. Missionization of people in the project area occurred later because of the distance from the missions, but by 1827, virtually all the Bay Miwok had been absorbed into either the San Francisco or San Jose missions. (City of Antioch, 2003)

In 1821, Mexico gained independence from Spain and under the 1824 General Law of Colonization, Mexican citizens were granted tracts of land or "ranchos." (Menchaca, 2002) Antioch contains portions of two adjoining ranchos: Los Meganos, originally granted to Jose Noriega in 1834 and later purchased by John Marsh in 1837, and Los Medanos, granted to Colonel Jonathan Drake Stevenson in 1839. (Hoover, 1970) Twin brothers from New Hampshire, William Wiggin Smith and Joseph Horton Smith, are credited as the founders of Antioch. The brothers came to California in 1849 for the Gold Rush, obtained a portion of Rancho Los Meganos from John Marsh and created a new settlement, originally called Smith's Landing. A group of New England frontier families soon arrived in California and were invited by William Smith to settle in Smith's Landing. On July 4, 1851, the citizens adopted Antioch, the name of a Biblical city in Syria, as the new name for their town. Shortly after its settlement, Antioch served as a major supply depot, shipping and receiving growing river commerce.

At the end of the 1850s, coal was discovered south of Antioch in the foothills of Mount Diablo. From the 1850s to 1880s, a coal mining industry developed and small towns began to develop adjacent to coal mines. Mining towns of Nortonville, Somersville, Stewardsville, Judsonville, and West Hartley flourished but then disappeared due to the rising costs and diminishing profits of the mines. In 1878, the Empire Railroad was established to transport coal from the coal fields to the San Francisco Bay. Another major economic mainstay during the 1860s and 1870s was grain (wheat and barley) farming. The Southern Pacific Railroad was interested in taking over the grain shipping business from its competitors and constructed the "San Pedro and Tulare Railroad" through the agricultural region. The arrival of the Southern Pacific established a number of small stations along the rail alignment, including Antioch.

In 1903, San Francisco businessman Charles Appleton Cooper purchased Rancho Los Medanos and sponsored industrialization in and around Pittsburg and Antioch. Hooper's development attracted other businesses, including oil refineries and a PG&E steam electric plant. The area was transformed into a major manufacturing center for industries including pottery, canneries, and paper mills. (City of Antioch, 2003) Following World War II, mass automobile ownership and the construction of new highways, such as Highway 24 and SR 4 spurred large-scale suburban growth in Antioch. Antioch doubled in population between 1940 and 1950 and increased its population by more than 250 percent between 1950 and 1980. By 2000 its population had almost doubled again and had become much more diverse. (San Francisco Bay Area Rapid Transit District, 2008)

Historic Resources

There are no federal-, State-, or County-listed historic sites within the Planning Area. A records search conducted by the Northwest Information Center (NWIC) of the California Historic Resources Information System at Sonoma State University in Rohnert Park identified three recorded historic-period cultural resources: the Southern Pacific Railroad (P-07-000813) and two historic-period residences (P-07-002882 and P-07-002883). (Guldenbrein, 2008) A background report prepared by Holman & Associates also identified these areas, along with other areas, as sites that may contain potentially significant historic resources.

1. The "Foundry" is a complex of three modern (post 1960s) buildings located on the parcel owned by PDQ Products in the southeast corner of the Planning Area. This site was depicted as "oil tanks" in 1916 and 1953 US Geological Survey quadrangles, reflecting its former use in conjunction with the Old Valley (OVP) pipelines built by Chevron's predecessors.

2. A small homestead is located at 2500 Willow Lane. The house appears to be of early 1930s construction, and has been severely damaged by fire. There is also a large wood-framed outbuilding on the property. Structures appear on this site as early as the 1916 quadrangle.
3. Two large debris piles are located south of Oakley Road and east of Willow Road. The debris may be associated with structures that appear in both the 1916 and 1953 quadrangles. Substantial amounts of modern debris have compromised the piles, but square nails recovered from the site suggest that potentially historic materials remain.
4. An abandoned segment of Southern Pacific's San Pedro and Tulare Railroad (1878-1925) alignment (formerly the Central Pacific Railroad) is located at the eastern edge of the Planning Area. No ties or spikes were observed during the survey, but large amounts of granite ballast mark the former alignment. The rail line alignment was recorded as a historic site P-07-2568, but it will not likely qualify for the National Register due to loss of integrity. (Baker & Shoup, 2008)

None of these areas appear to possess architecturally significant elements or integrity which may make them eligible for inclusion on the California Register of Historic Resources. However, additional archival research and field testing may be necessary to fully evaluate the historical significance of these sites. (Holman and Associates, 2007)

Contemporary Native American Resources

As part of the Hillcrest Station Area Specific Plan planning process, a letter was sent to the Native American Heritage Commission (NAHC) on March 24, 2008. The response dated April 3, 2008 stated that a record search of the sacred land file failed to indicate the presence of Native American cultural resources within the Planning Area. Letters of inquiry were sent to the three tribal representatives listed in the NAHC response. No replies from those tribes have been received.

Paleontological Resources

Fossil remains are considered to be important as they provide indicators of the earth's chronology and history. These resources are afforded protection under CEQA and are considered to be limited and nonrenewable, and they provide invaluable scientific and educational data. The University of California Museum of Paleontology specimens list contains more than 2,000 localities where fossils have been found in Contra Costa County. At least eight localities are located in the City of Antioch. (University of California Museum of Paleontology)

REGULATORY SETTING

Definitions

Archaeological Resources

Archaeological resources are places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may be either prehistoric (before the introduction of writing in a particular area) or historic (after the introduction of writing). The majority of such places in this region are associated with either Native American or Euroamerican occupation of the area. The most frequently encountered prehistoric and early historic Native American archaeological sites are village settlements with residential areas and sometimes cemeteries; temporary camps where food and raw materials were collected; smaller, briefly

occupied sites where tools were manufactured or repaired; and special-use areas like caves, rock shelters, and sites of rock art. Historic archaeological sites may include foundations or features such as privies, corrals, and trash dumps.

Historic Resources

Historic resources are standing structures of historic or aesthetic significance. Architectural sites dating from the Spanish Period (1529-1822) through the early years of the Depression (1929-1930) are generally considered for protection if they are determined to be historically or architecturally significant. Post-depression sites may also be considered for protection if they could gain significance in the future. Historic resources are often associated with archaeological deposits of the same age.

Ethnographic Resources

Contemporary Native American resources, also called ethnographic resources, can include archaeological resources, rock art, and the prominent topographical areas, features, habitats, plants, animals, and minerals that contemporary Native Americans value and consider essential for the preservation of their traditional values.

Paleontological Resources

Paleontological resources are the mineralized (fossilized) remains of prehistoric plant and animal life exclusive of human remains or artifacts. Fossil remains such as bones, teeth, shells, and leaves are found in geologic deposits (rock formations) where they were originally buried.

Federal Regulations

National Historic Preservation Act

The National Historic Preservation Act (NHPA) is the most prominent federal law dealing with historic preservation. The 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 the National Environmental Policy Act (NEPA) are also subject to compliance with Section 106 of the NHPA. At the federal level, the Office of Historic Preservation (OHP) carries out reviews under Section 106 of the NHPA.

National Register of Historic Places

NHPA authorizes the Secretary of the Interior to establish a National Register of Historic Places (National Register), an inventory of districts, sites, buildings, structures, and objects significant on a national, State, or local level in American history, architecture, archeology, engineering, and culture. The National Register is maintained by the National Park Service, the Advisory Council on Historic Preservation, State Historic Preservation Office, and grants-in-aid programs.

To be potentially eligible for listing on the National Register of Historic Places (NRHP), a building must usually be over 50 years old and must have historic significance and must retain its physical integrity. More detailed eligibility criteria are described in the Code of Federal

Regulations, Title 36, Part 60. Historical Resources achieving significance with less than 50 years may be considered for listing if they are of "exceptional importance," or if they are integral parts of districts that are eligible for listing in the National Register

Procedures for the Protection of Historic Properties (33 CFR 325, Appendix C)

Code of Federal Regulations, Section 33, Part 325 establishes the procedures to be followed by the U.S. Army Corps of Engineers to fulfill the requirements set forth in the National Historic Preservation Act (NHPA), other applicable historic preservation laws, and Presidential directives as they relate to the regulatory program of the Corps of Engineers.

State Regulations

Office of Historic Preservation

California Public Resources Code 5024 requires consultation with the State Historic Preservation Officer (SHPO) when a project may impact historical resources located on State-owned land.

California Register of Historic Resources

The SHPO also maintains the California Register of Historic Resources (California Register). Historic properties listed, or formally designated for eligibility to be listed, on the National Register are automatically listed on the California Register (Public Resources Code, Section 5024.1). State Landmarks and Points of Interest are also automatically listed. The California Register can also include properties designated under local preservation ordinances or identified through local historic resource surveys.

For a historic resource to be eligible for listing on the California Register, it must be significant at the local, state, or national level under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. It is associated with the lives of persons important to local, California, or national history;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation (California Public Resources Code, Section 5024.1).

Additional criteria are listed in California Code of Regulations, Title 14, Chapter 11.5. A building must usually be over 50 years old, must have historic significance, and must retain its physical integrity. Historical resources achieving significance within less than 50 years may be considered for listing in the California Register if it can be demonstrated that sufficient time has passed to understand it historical importance.

California Environmental Quality Act

21083.2: Archaeological Resources

CEQA directs the lead agency on any project undertaken, assisted, or permitted by the State to include in its environmental impact report for the project a determination of the project's effect on

unique archeological resources; defines unique archeological resource; enables a lead agency to require an applicant to make reasonable effort to preserve or mitigate impacts to any affected unique archeological resource; sets requirements for the applicant to provide payment to cover costs of mitigation; and restricts excavation as a mitigation measure.

21084.1: Historic Resources

CEQA establishes that adverse effects on an historical resource qualifies as a significant effect on the environment; and defines historical resource.

CEQA Guidelines

Historic Resources

Section 15064.5 of CEQA guidelines define three ways that a property can qualify as a significant historical resource for the purposes of CEQA review:

1. If the resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR);
2. If the resource is included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code, or is identified as significant in a historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code unless a preponderance of evidence demonstrates that it is not historically or culturally significant; or,
3. If the lead agency determines the resource to be significant as supported by substantial evidence (California Code of Regulations, Title 14, Division 6, Chapter 3, section 15064.5).

In addition to determining the significance and eligibility of any identified historical resource under CEQA and the California Register, historic properties must be evaluated under the criteria for the National Register should federal funding or permitting become involved in any undertaking subject to this document.

Archeological Resources

CEQA Guidelines Section 15126.4 states that "public agencies should, whenever feasible, seek to avoid damaging effects on any historical resources of an archeological nature." The Guidelines further state that preservation-in-place is the preferred approach to mitigate impacts on archaeological resources. However, according to Section 15126.4, if data recovery through excavation is "the only feasible mitigation," then a "data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resources, shall be prepared and adopted prior to any excavation being undertaken." Data recovery is *not* required for a resource of an archaeological nature if "the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historical resource." The section further states that its provisions apply to those archaeological resources that also qualify as historic resources.

Native American Heritage Act

Also relevant to the evaluation and mitigation of impacts to cultural resources, the Native American Heritage Act (NAHA) of 1976 established the Native American Heritage Commission

(NAHC) and protects Native American religious values on state property (see California Public Resources Code 5097.9). PRC 5097.98 defines the steps that need to be taken if human remains are identified on a site, including the notification of descendants and the disposition of remains and grave goods.

Public Notice to California Native American Indian Tribes

Government Code, Section 65092 includes California Native American tribes that are on the contact list maintained by the Native American Heritage Commission in the definition of "person" to whom notice of public hearings shall be sent by local governments.

Tribal Consultation Guidelines

Passed in 2004, Senate Bill (SB) 18 (Burton, D-San Francisco) now Government Code Section 65351 and 65352 establishes a procedure to help tribes and jurisdictions define tribal cultural resources and sacred areas more clearly and incorporate protection of these places earlier into the General Plan and Specific Plan processes. The SB 18 process mirrors the federal 106 Review process used by archaeologists as part of the environmental review conducted under NEPA (36 CFR Part 800.16) While not a component of CEQA review per se, the Lead agency is required to request consultation with responsible and trustee agencies, such as NAHC and neighboring tribes, during the initial study and EIR process (PRC 21080.3, 21080.4).

Disposition of Human Remains

Health and Safety Code Section 7050.5 states that when an initial study identifies the existence, or the probable likelihood, of Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the NAHC as provided in Public Resources Code 5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials. Furthermore, 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 NAHC.

Native American Graves Protection and Repatriation Act

Health and Safety Code Section 8010-8011 establishes a state repatriation policy intent that is consistent with and facilitates implementation of the federal Native American Graves Protection and Repatriation Act. The Act strives to ensure that all California Indian human remains and cultural items are treated with dignity and respect. It encourages voluntary disclosure and return of remains and cultural items by publicly funded agencies and museums in California. It also states the intent for the state to provide mechanisms for aiding California Indian tribes, including non-federally recognized tribes, in filing repatriation claims and getting responses to those claims.

California Historical Resources Information System

The California Historical Resources Information System (CHRIS) is a statewide system for managing information on the full range of historical resources identified in California. CHRIS is a cooperative partnership between the citizens of California, historic preservation professionals, twelve Information Centers, and various agencies. This system bears the following responsibilities: integrate newly recorded sites and information on known resources into the

California Historical Resources Inventory; furnish information on known resources and surveys to governments, institutions, and individuals who have a justifiable need to know; and supply a list of consultants who are qualified to do work within their area.

Typically, the initial step in addressing cultural resources in the project review process involves contacting the appropriate Information Center to conduct a record search. A record search should identify any previously recorded historical resources and previous archaeological studies within the project area, as well as provide recommendations for further work, if necessary. Depending on the nature and location of the project, the project proponent or lead agency may be required to contact appropriate Native American representatives to aid in the identification of traditional cultural properties.

If known cultural resources are present within the proposed project area, or if the area has not been previously investigated for the presence of such resources, the Information Center may recommend a survey for historical, archaeological and paleontological sites. Cultural resources that may be adversely affected by an undertaking could warrant further evaluation for test excavations. For historical sites or standing structures, historical research may be necessary and an architectural evaluation may be warranted. Data recovery excavations may be warranted in the case of unavoidable damage to archaeological sites. If human burials are present, contact the appropriate Coroner's office. A professional archaeologist and appropriate Native American representatives should also be consulted (Sections 21083.2 and 21084.1 of the PRC).

When an initial study identifies the existence, or the probable likelihood, of Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code 5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the Native American Heritage Commission.

Local Regulations: Antioch General Plan Resource Management Policies

10.9.2 Cultural Policies

a. Require new development to analyze, and therefore avoid or mitigate impacts to archaeological, paleontological, and historic resources. Require surveys for projects having the potential to impact archaeological, paleontological, or historic resources. If significant resources are found to be present, provide mitigation in accordance with applicable CEQA guidelines and provisions of the California Public Resources Code.

b. If avoidance and/or preservation in the location of any potentially significant cultural resource is not possible, the following measures shall be initiated for each impacted site:

- A participant-observer from the appropriate Indian Band or Tribe shall be used during archaeological testing or excavation in the project site.
- Prior to the issuance of a grading permit for the project, the project proponent shall develop a test-level research design detailing how the cultural resource investigation shall be executed and providing specific research questions that shall be addressed through the excavation program. In particular, the testing program shall characterize the site

constituents, horizontal and vertical extent, and, if possible, period of use. The testing program shall also address the California Register and National Register eligibility of the cultural resource and make recommendations as to the suitability of the resource for listing on either Register. The research design shall be submitted to the City of Antioch for review and comment. For sites determined, through the Testing Program, to be ineligible for listing on either the California or National Register, execution of the Testing Program will suffice as mitigation of project impacts to this resource.

- After approval of the research design and prior to the issuance of a grading permit, the project proponent shall complete the excavation program as specified in the research design. The results of this excavation program shall be presented in a technical report that follows the City's outline for Archaeological Testing. The Test Level Report shall be submitted to the City for review and comment. If cultural resources that would be affected by the project are found ineligible for listing on the California or National Register, test-level investigations will have depleted the scientific value of the sites and the project can proceed.
- If the resource is identified as being potentially eligible for either the California or National Register, and project designs cannot be altered to avoid impacting the site, a Treatment Program to mitigate project effects shall be initiated. A Treatment Plan detailing the objectives of the Treatment Program shall be developed. The Treatment Plan shall contain specific, testable hypotheses relative to the sites under study and shall attempt to address the potential of the sites to address these research questions. The Treatment Plan shall be submitted to the City for review and comment.
- After approval of the Treatment Plan, the Treatment Program for affected, eligible sites shall be initiated. Typically, a Treatment Program involves excavation of a statistically representative sample of the site to preserve those resource values that qualify the site as being eligible for the California or National Register. At the conclusion of the excavation or research program, a Treatment Report shall be developed. This data recovery report shall be submitted to the City for review and comment.

c. When existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor site grading activities with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate reposition, and file a report with the Community Development Department documenting any paleontological resources found during site grading.

d. As a standard condition of approval for new development projects, require that if unanticipated cultural or paleontological resources are encountered during grading, alteration of earth materials in the vicinity of the find be halted until a qualified expert has evaluated the find and recorded identified cultural resources.

e. Preserve historic structures and ensure that alterations to historic buildings and their immediate settings are compatible with the character of the structure and the surrounding neighborhood.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

The proposed Specific Plan would have a significant adverse impact on cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature;
- Disturb any human remains, including those interred outside of formal cemeteries.

METHODOLOGY AND ASSUMPTIONS

The Northwest Information Center (NWIC) of the California Historic Resources Information System at Sonoma State University in Rohnert Park was faxed a data request on March 24, 2008. The request was emailed to the NWIC on June 6, 2008. The NWIC is an affiliate of the State of California Office of Historic Preservation and is the official State repository of cultural resources reports and records for a 16-county area, including Contra Costa. A response dated July 1, 2008 was received.

The disposition of Native American burial falls within the jurisdiction of the Native American Heritage Commission (NAHC). The NAHC was contacted on March 24, 2008. A response dated April 3, 2008 was received. Letters to three tribal representatives were sent May 27, 2008. No responses to those letters were received.

In addition to the records searches, the City of Antioch Draft General Plan Update Environmental Impact Report, the eBART Corridor Draft Environmental Impact Report, and a memo prepared by Holman & Associates for Brosamer and Wall, entitled "Cultural Resources Field Inspection of the County Crossings Project, Antioch, Contra Costa County, California" were reviewed. The Holman & Associates memo summarized an archaeological literature review and a visual field inspection.

SUMMARY OF IMPACTS

The primary impact that could occur would be the disturbance of cultural resources during project construction, subsequent to adoption of the Specific Plan.

Based on the NWIC's evaluation of the environmental setting and features associated with known sites, there is a reasonable possibility of uncovering and identifying additional archeological deposits in the Planning Area. Existing national, state and local laws as well as policies contained in the General Plan would reduce these potential impacts on historic and archeological resources to less than significant levels.

Paleontological resources have been documented to occur in Antioch. There is potential to encounter unidentified fossils during construction of new development in the Station Area. Since

fossils are considered to be nonrenewable resources, such impacts would be considered significant.

There are no federal-, State-, or County-listed historic sites within the Planning Area. However, Holman & Associates identified four sites that may contain potentially significant historic resources. Even though these sites do not appear to possess architecturally significant elements or integrity, additional research is recommended to determine their eligibility for inclusion on the California Register of Historic Resources.

IMPACTS AND MITIGATION MEASURES

3.6-1 ***New development under the proposed Plan has the potential to adversely affect historic resources that appear on State historical inventories or may be eligible for inclusion on such lists. (Less than Significant)***

There are no federal-, State-, or County-listed historic sites within the Planning Area. However, Holman & Associates identified four sites that may contain potentially significant historic resources:

1. The "Foundry" (APN: 052-052-002)
2. 2500 Willow Lane
3. Two debris piles south of Oakley Road and east of Willow Road
4. Abandoned railroad spur

Even though these sites do not appear to possess architecturally significant elements or integrity, additional research is recommended to determine their eligibility for inclusion on the California Register of Historic Resources.

Current federal, state, and local laws as well as the policies summarized below reduce potential impacts on historic resources to less than significant levels.

Specific Plan Policies that Reduce the Impact

EH-27 Require the project sponsor to complete the California Department of Parks and Recreation site forms for submittal to the California Archaeological Inventory located at Sonoma State University for each of the sites listed below. As part of the effort, require the project sponsor to complete focused historical archival research for the project area to chronicle historic development since the late 19th Century. This will help inform the determination of whether the sites are eligible to be designated as historic resources.

- The "Foundry" (APN: 052-052-002)
- 2500 Willow Lane
- Two debris piles south of Oakley Road and east of Willow Road
- Abandoned railroad spur

EH-28 If any resource is found to be eligible for inclusion on the California Register of Historic Resources, the project sponsor shall consult with the State Historic Preservation Officer (SHPO) to document the existing condition, in order to establish for posterity a record of the historic property prior to its alteration, relocation, or demolition, and to identify any further requirements for environmental review and/or mitigation.

Mitigation Measures

No mitigation measures are required.

3.6-2 ***New development within the Planning Area has the potential to disrupt undiscovered archaeological resources and human remains. (Less than Significant)***

A records search revealed no known recorded archeological sites occur within the Planning Area. However, the review of the Planning Area conducted by the NWIC identified 3 recorded historic-period buildings and structures. According to the NWIC, given these factors, there is a high possibility of identifying historic-period archeological resources in the project area. A comprehensive mechanical subsurface testing program was carried out in 2008 by Holman & Associates. A total of 54 trenches, seven feet in length, spaced 66-197 feet apart, were excavated in an effort to locate and define any buried cultural resources. No evidence of buried cultural resources was encountered during the trenching effort.

In this part of Contra Costa County, Native American cultural resources have been found near sources of water including perennial and intermittent streams and springs, near the margin of the bay, and near productive ecotones. The Planning Area contains mainly valley lands, as well as the hill to valley interface area, with drainage canyons and creeks. Given the similarly of these environmental factors, the NWIC has determined that there is a moderate likelihood that unrecorded Native American cultural resources exist in the Planning Area. The report of findings of the mechanical subsurface testing program determined that there remains some potential that earthmoving north of the East Antioch Creek bank may turn up isolated groups of human burials.

Even though no known sites are documented to occur in the Planning Area, there is a reasonable possibility of uncovering and identifying additional archeological resources in the Planning Area. New development activities may adversely affect these archeological resources during ground disturbance activities.

Pursuant to CEQA Guidelines 15064.5 (f), if potentially significant cultural resources are discovered during ground-disturbing activities associated with project preparation, construction, or completion, work shall halt in that area until a qualified archaeologist can assess the significance of the find, and, if necessary, develop appropriate treatment measures in consultation with Contra Costa County and other appropriate agencies and interested parties. For example, a qualified archaeologist shall follow accepted professional standards in recording any find including submittal of the standard Department of Parks and Recreation (DPR).Primary Record forms (Form DPR 523) and locational information to the California Historical Resources Information Center office (Northwest Information Center). The consulting archaeologist shall also evaluate such resources for significance per California Register of Historical Resources eligibility criteria (Public Resources Code Section 5024.1; Title 14 CCR Section 4852). If the archaeologist determines that the find does not meet the CEQA standards of significance, construction shall proceed. On the other hand, if the archaeologist determines that further information is needed to

evaluate significance, the Planning Department staff shall be notified and a data recovery plan shall be prepared.

All future development in the Planning Area will be in accordance with State laws pertaining to the discovery of human remains. Accordingly, if human remains of Native American origin are discovered during project construction, the developer and/or the Planning Department would be required to comply with state laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (PRC Sec. 5097). Sections 21083.2 and 21084.1 of the PRC states that if any human remains are discovered or recognized in any location on the project site, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

a. The Contra Costa County Coroner/Sheriff has been informed and has determined that no investigation of the cause of death is required; and

b. If the remains are of Native American origin,

- The descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98, or
- The Native American Heritage Commission was unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission.

Overall, current federal, state, and local laws, including the General Plan policies listed in the Regulatory Section, would reduce these impacts on archaeological resources to less than significant levels.

Mitigation Measures

No mitigation measures are required.

3.6-3 ***Implementation of the proposed Specific Plan could adversely affect unidentified paleontological resources. (Less than Significant)***

The University of California Museum of Paleontology (UCMP) lists over 2,000 localities where fossils have been found in Contra Costa County. (University of California Museum of Paleontology) At least eight of these findings are documented to be in Antioch and others can be assumed. The localities contain records for various Mammalia, including Mammoth, Bison, Deer, and Badger. Pleistocene fluvial deposits which are sedimentary deposits are considered sensitive for vertebrate fossils, which are considered a significant paleontological resource. Furthermore, rock units from which vertebrate fossils have been recovered are considered to have potential for containing significant non renewable fossiliferous resources. (Society of Vertebrate Paleontology, 2007)

There is potential to encounter unidentified fossils during construction of new development. Since fossils are considered to be nonrenewable resources, such impacts would be considered significant. Adverse impacts on paleontological resources could occur when earthwork activities such as mass excavation cut into geological formations, or depths below the soil layer, which is

generally six feet deep. These impacts are in the form of physical destruction of fossil remains. Project specific evaluation, monitoring during construction, and possible fossil recovery in the event fossils are discovered, would reduce the potential of adverse impacts to paleontological resources. General Plan policies along with current federal, state, and local laws would reduce these impacts on paleontological resources to less than significant levels.

Mitigation Measures

No mitigation measures are required.

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3.7 Geological and Seismic Hazards

This section describes geologic and seismic conditions in the Hillcrest Station Area Specific Plan Planning Area (referred to throughout this section as "Planning Area") to provide relevant background information of the physical characteristics of the Planning Area with respect to geologic hazards, soils, and seismic conditions. The following information is compiled from geologic maps and reports available from Contra Costa County, City of Antioch, the California Geological Survey (CGS; formerly California Divisions of Mines and Geology), the U.S. Geographical Survey (USGS), the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), and the Association of Bay Area Governments (ABAG).

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Topography

The Planning Area is located in northeastern Contra Costa County, on the northern flank of Mount Diablo at the southern edge of the Pittsburg-Antioch Plain. The Pittsburg-Antioch Plain is an alluvial plain that slopes gently north away from the base of the foothills of Mount Diablo to the tidal marshes of the Sacramento-San Joaquin Delta. The northern half of the alluvial plain is dominated by salt water marshes; the southern half is underlain by alluvial materials eroded from the Diablo Range to the south.

With the exception of two hills adjacent to Highway 4 (SR 4), the Planning Area is a shallow valley bisected by East Antioch Creek, which meanders in a northwest direction across the site and empties into the San Joaquin River approximately 1.5 miles northwest of the site. The topography of the Planning Area varies from gentle slopes of 2-3 percent on the valley floor to 15-30 percent slopes on the hilly areas in the southeast. Ground elevations within the Planning Area range from approximately 20 feet above mean sea level (msl) at the western edge of the site, to approximately 200 feet above msl in the southeast (see Figure 3.7-1).

Geology

The Planning Area is within the Coast Range Geomorphic Province of California. This province is characterized by a series of northwest-trending mountain ranges, ridges, and intervening valleys that run generally parallel to the San Andreas Fault System. The San Andreas Fault System includes several major fault zones, or areas with numerous fractures, including the San Andreas, Hayward, and Calaveras fault zones. These mountain ridges and valleys have been formed by the shearing action of the San Andreas Fault and other associated faults along the margin of the Pacific and North American tectonic plates over the course of millions of years.

The underlying geologic materials of the region are defined by the location of the San Andreas Fault, which separates two bedrock complexes or distinct groups of rocks: the Salinian Block and the Franciscan Formation. Contra Costa County is located to the east of the fault and is underlain by the Franciscan Formation. The rocks of the Franciscan Formation represent pieces of former oceanic crust that have been accreted to North America by subduction and collision. In this region

of California, the Franciscan Formation bedrock complex is composed primarily of deep marine sandstone and shale (ancient seafloor sediments), basalt, chert (ancient silica-rich ocean deposits), and greenstone (altered volcanic deposits).

The surficial geology of the Pittsburg-Antioch Plain is characterized by unconsolidated alluvium, terrace deposits, and bay mud. In the immediate vicinity of the Planning Area, the area northeast of East Antioch Creek is underlain by fine-grained beach and dune sands. The area southwest of the creek is underlain by alluvial fan deposits (Graymer, et al, 2006a). At the southeastern edge of the Planning Area and at the toe of the foothills to Mount Diablo, the bedrock geology is comprised of sedimentary deposits of the Tulare formation. Materials of this formation consist of poorly consolidated non-marine siltstone, sandstone, and conglomerate, with some tuff (volcanic ash deposits) (Graymer, et al, 1994).

Soils

Surface soils exhibit various characteristics dependent on location, slope, parent rock, climate, and drainage. According to soil survey information obtained from the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), surface soils in the Planning Area range from clay and silty clay loam to fine-grained sand (see Table 3.7-1). At the northeast corner of the site and northeast of East Antioch Creek, site soils consist primarily of Delhi sand (DaC), which is characterized by sands formed from granitic rock sources on flood plains, alluvial fans, and terraces. With the exception of the hilly areas in the southeast portion of the site, site soils southwest of the creek are of the Zamora (ZaA) series, which consist of silty clay loam, clay loam, silt loam, and gravelly clay loam formed in sedimentary alluvium on nearly level flood plains. In the south-central portion of the Planning Area, soils are mapped as Capay clay (CaC). The hilly portions of the area in the southeastern portion of the area, are mapped as Los Oso clay loam (LhE), and Diablo clay (DdE), which are characterized as clays and silty clays. Soils along the northern reach of East Antioch Creek channel are mapped as Sycamore Silty clay loam (So) and are characterized as silty clay loam, silt loam, and stratified loamy fine sand to silty clay formed on nearly level floodplains (USDA SCS, 1977). Soils in the Planning Area are mapped on Figure 3.7-2.

Soils are generally characterized by their properties of: shrink-swell potential, erosion potential, and runoff potential. The degree to which a soil will undergo changes in volume depends on the moisture and clay content of the soil. With the exception of the Delhi sands northeast of East Antioch Creek, site soils have relatively high clay content. Soils with relatively high clay content swell or expand when wetted and shrink or contract as they dry (shrink-swell potential), are more susceptible to soil expansion, and can threaten the stability of structures without adequately engineered foundations. Also, these clayey soils do not absorb water readily and generate moderately high to high rates of runoff. The hazard of erosion by running water of these soils varies from slight where gently sloping, to moderate in the hilly areas at the southeast portion of the Planning Area (USDA SCS, 1977).

Seismologists have observed that soft soils can amplify seismic ground shaking. Generally, water-saturated mud and artificial fill are expected to have the strongest amplification of shaking; sands and silts are expected to have significant amplification of shaking; while clays are expected to have slightly less significant amplification. A soil type and shaking hazard map prepared by the National Earthquake Hazards Reduction Program (NEHRP) that evaluates the velocity at which certain soils transmits shear waves (S-waves) indicates that soils at the northeast corner of the

Planning Area and northeast of East Antioch Creek can significantly amplify seismic ground shaking. Soils at the southwest corner of the site (and southwest of East Antioch Creek) can cause moderate to significant amplification of seismic ground shaking (USGS, 2008).

Table 3.7-1 Planning Area Soils

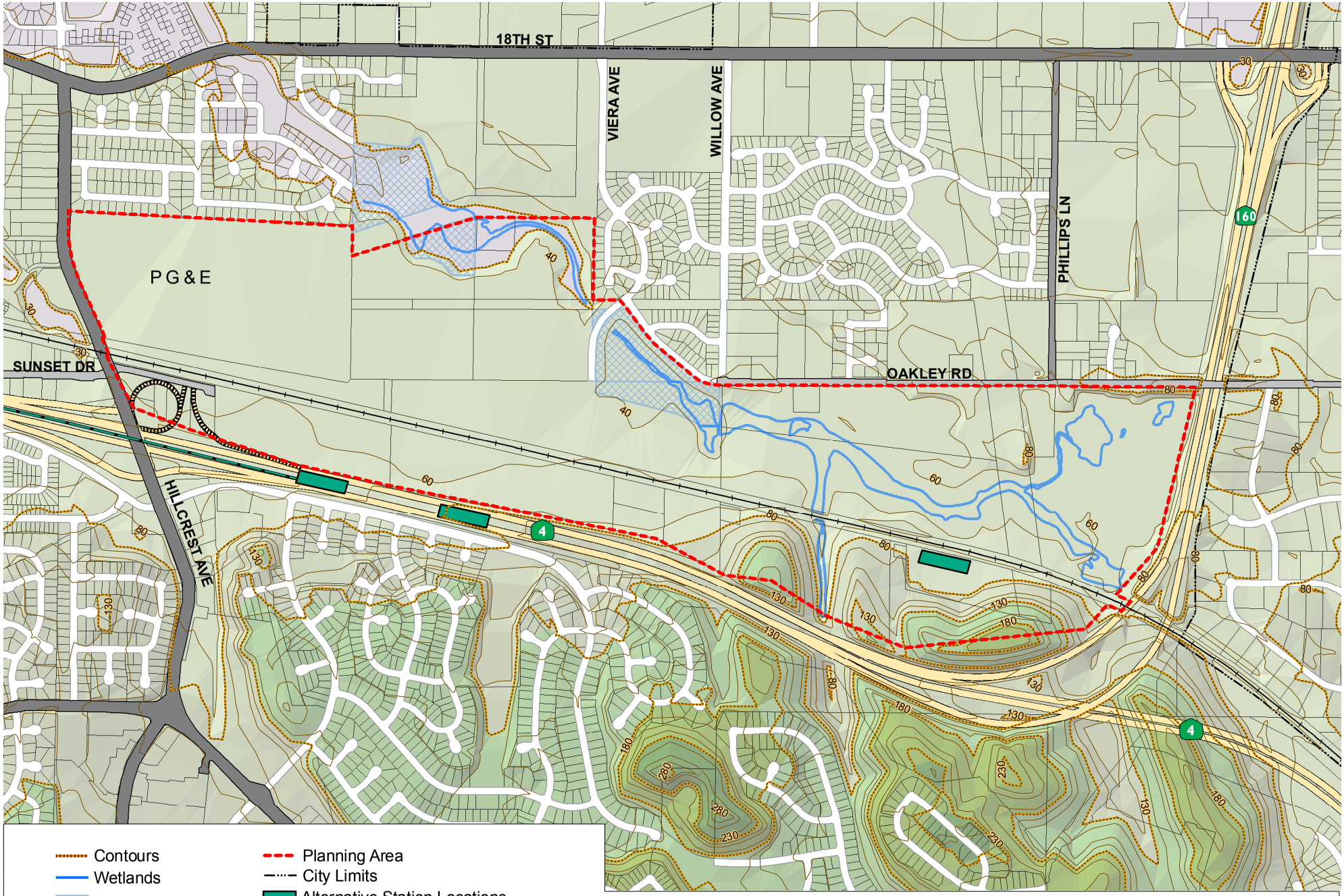
Map Symbol	*Soil Name/ Slope*	*Topsoil/Subsoil Texture*	*Shrink-Swell Potential*	*Erosion Potential*	*Hydrologic Soil Group* [1]	*% of Planning Area*
CaC	Capay Clay, 2 to 9% slopes	Clay, silty clay loam, and clay loam	High	Slight	D	6%
DaC	Delhi Sand, 2 to 9% slopes	Sand	Low	Slight	A	22%
DdE	Diablo Clay, 15 to 30% slopes	Clay and silty clay	High	Moderate	D	7%
LhE	Los Osos Clay Loam, 15% slopes	Clay loam and clay	High	Moderate	C	3%
RbD	Rincon Clay Loam, 9 to 15 percent slopes	Clay loam, sandy clay, clay, clay loam, and silty clay loam	Moderate to High	Slight	C	<1%
So	Sycamore Silty Clay Loam	Silty clay loam, silt loam, and stratified loamy fine sand to silty clay	Moderate	Slight	C	6%
ZaA	Zamora Silty Clay Loam, 0 to 2% slopes	Silty clay loam, clay loam, silt loam, and gravelly clay loam	Moderate	Low	B	56%

1. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. Hydrologic soil group: A= high infiltration rate/low runoff potential; B= moderate infiltration rate/moderate runoff potential; C= slow infiltration rate/moderately high runoff potential; D= very slow infiltration rate/high runoff potential.

Source: USDA SCS, 1977.

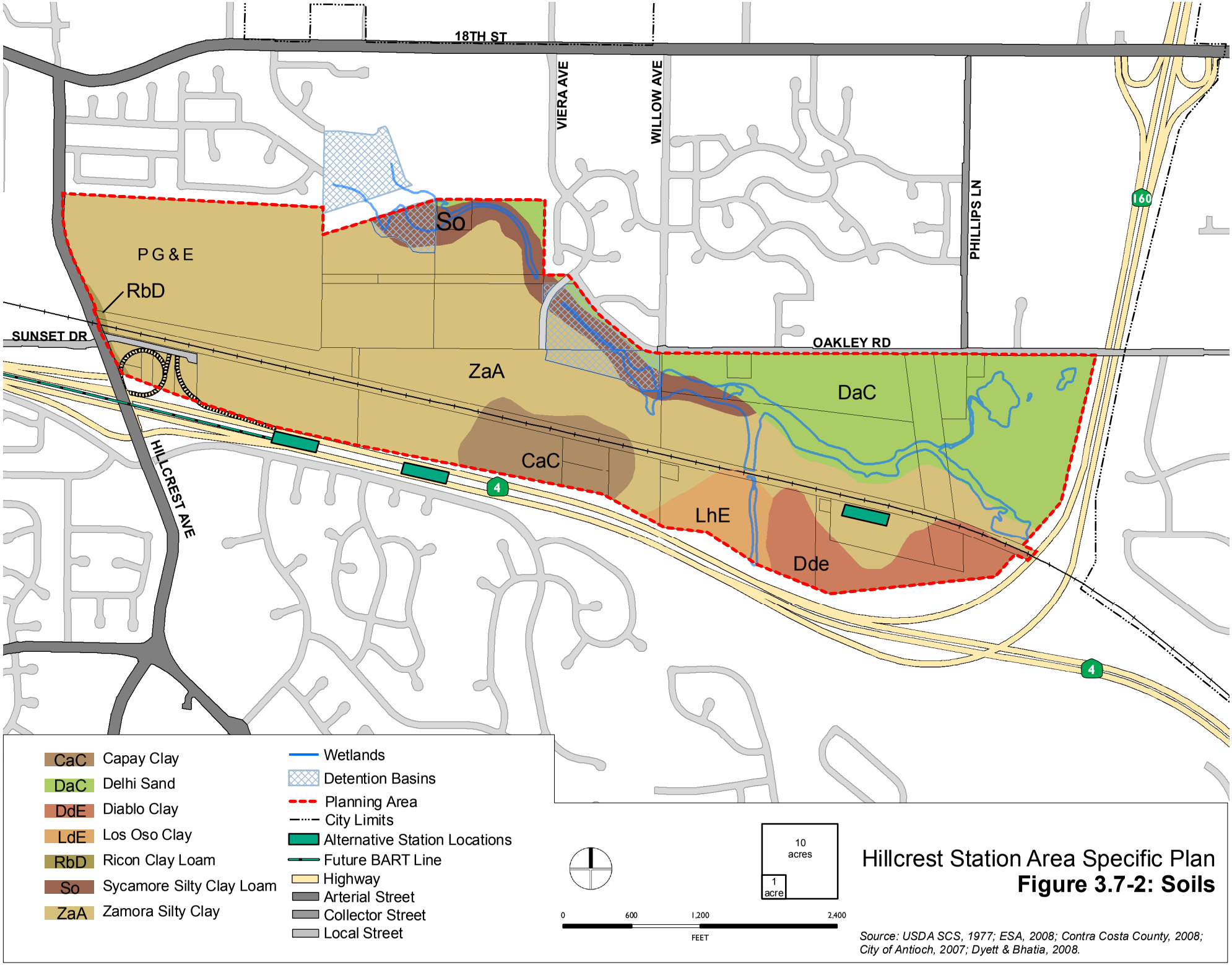
Mineral Resources

Mineral extraction is important in Contra Costa County, as in other counties, because minerals such as crushed rock, sand, among others, supply the necessary components for local home building as well as for a diverse array of other industries. According to a map of mineral resource areas in the Contra Costa County General Plan, no significant mineral resource areas exist within or in the vicinity of the Planning Area (Contra Costa County, 2005).



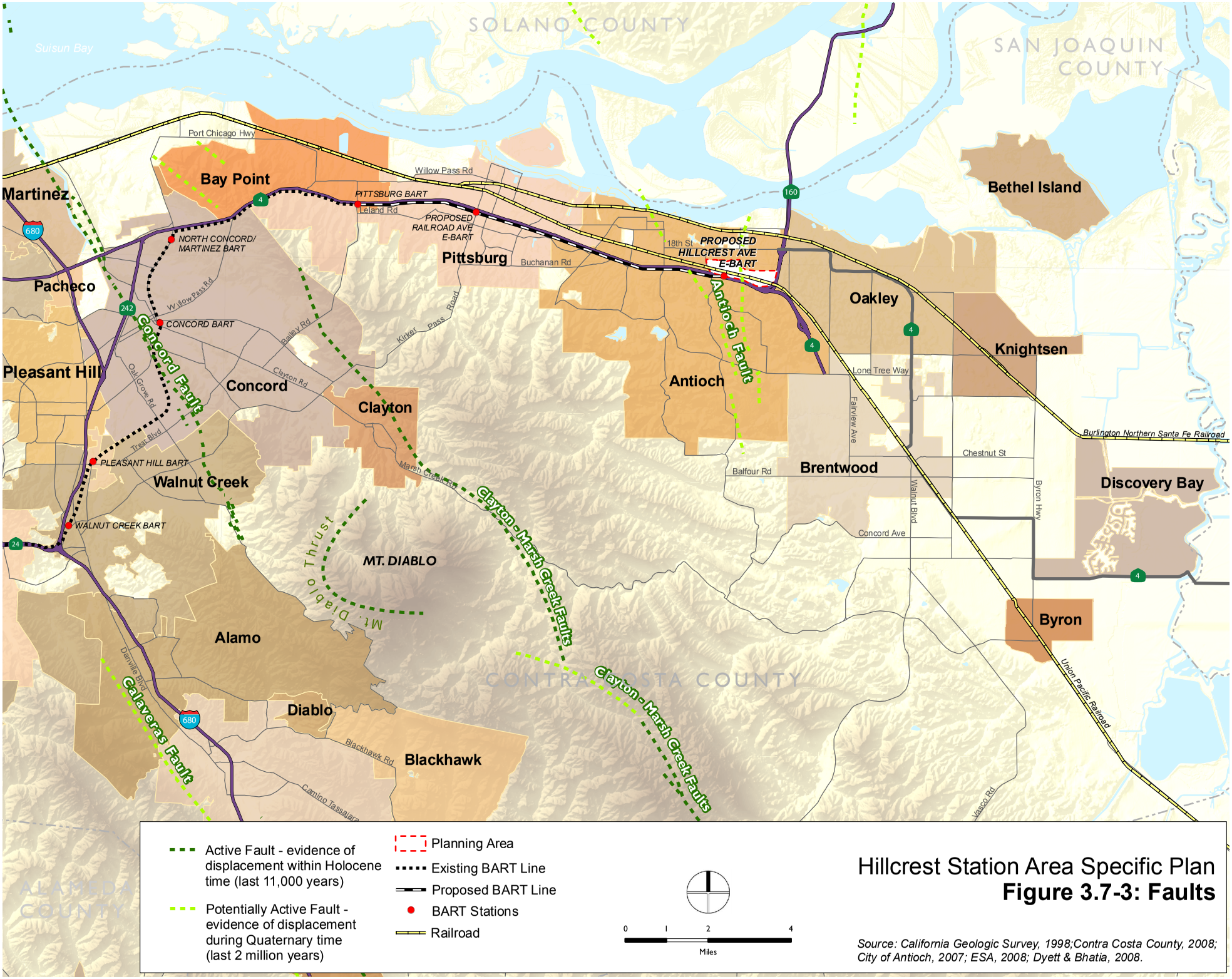
Hillcrest Station Area Specific Plan
Figure 3.7-1: Topography

Source: Contra Costa County, 2004; City of Antioch, 2007; USGS, 2007.



Hillcrest Station Area Specific Plan
Figure 3.7-2: Soils

Source: USDA SCS, 1977; ESA, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.



Hillcrest Station Area Specific Plan
Figure 3.7-3: Faults

Source: California Geologic Survey, 1998;Contra Costa County, 2008; City of Antioch, 2007; ESA, 2008; Dyett & Bhatia, 2008.

Seismicity

The City of Antioch, as well as the San Francisco Bay Area as a whole, is located in one of the most seismically-active regions in the United States. The 1997 Uniform Building Code locates the entire Bay Area within Seismic Risk Zone 4, which represents the maximum seismic risk zone. The 2003 report by the Working Group on California Earthquake Probabilities estimated that there is a 62 percent probability of at least one magnitude 6.7 or greater earthquake to occur on one of the major faults within the San Francisco Bay region before 2032 (USGS, 2003). Major earthquakes have occurred in the vicinity of the City of Antioch in the past, and can be expected to occur again in the near future.

Regional Faults

The California Geological Survey (formerly California Division of Mines and Geology) classifies recognized faults in the State based on their potential seismicity. Faults are classified as active, potentially active, or inactive. A fault that shows evidence of movement within Holocene time (approximately the last 11,000 years) is defined as *active*. A fault segment is considered *potentially active* if there is evidence of displacement during Quaternary time (approximately the last 2 million years) (Hart and Bryant 1997).

Active and potentially active faults affecting the Planning Area are listed in Table 3.7-2. Although recognized active faults are located within the City of Antioch, several major active faults are located within a few miles. The San Andreas, Hayward, Calaveras, and Rodgers Creek faults pose the greatest threat to producing significant earthquakes in the region. Other principal Bay Area faults capable of producing significant ground shaking in the Planning Area include the Concord–Green Valley, Clayton-Marsh Creek-Greenville, and Mount Diablo Thrust faults. In addition, the Antioch fault, which is considered to be potentially active but is not zoned under the Alquist-Priolo Act as potentially capable of surface rupture, is located less than 1 mile northeast of the Planning Area. Considerable seismic events can occur on faults with a long period of inactivity, although it is generally considered less likely.

Table 3.7-2 presents the relative location of the major fault zones and the maximum parameters for earthquakes on known major faults in the region. The magnitude (M) is a measure of the energy released in an earthquake. The estimated magnitudes, described as moment magnitudes (Mw) represent *characteristic* earthquakes on particular faults.[1] Intensity is a measure of the ground shaking effects at a particular location. However, ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. The composition of underlying soils, even those relatively distant from faults, can intensify ground shaking.

[1] Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CDMG, 1997b). The concept of "characteristic" earthquake means that we can anticipate, with reasonable certainty, the actual earthquake that can occur on a fault.

Table 3.7-2 Active and Potentially Active Faults Affecting the Planning Area

Fault	*Distance and Direction from Planning Area*	*Recency of Movement*	*Fault Classification* [1]	*Maximum Moment Magnitude (Mw)* [2]	*Maximum Intensity (MMI)* [3]
San Andreas	42 miles west	Historic (1906, 1989) Holocene	Active	7.9	VI-V
Hayward	24 miles west	Historic (1836, 1868) Holocene	Active	7.1	VI-V
Calaveras	18 miles southwest	Historic (1961, 1911, 1984) Holocene	Active	6.8	VII-VI
Concord-Green Valley	11 miles west	Historic (1955) Holocene	Active	6.7	VII-VI
Clayton-Marsh Creek-Greenville	7 miles west	Historic (1980) Holocene	Active	6.9	VII-VI
Mount Diablo Thrust	11 miles southwest	Historic	Active	6.7	VIII-VII
Rodgers Creek	36 miles northwest	Historic	Active	7.0	VI-V
Antioch	<1 mile northeast	Historic	Potentially Active	Not available	Not available

1. An "active" fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A "potentially active" fault has shown evidence of displacement during Quaternary time (approximately the last 2 million years). The fault classifications are derived from the Fault Activity Map of California and Adjacent Areas (Jennings, 1994).
2. Moment magnitude (Mw) is related to the physical size of a fault rupture and movement across a fault. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CDFG, 1997). The Maximum Moment Magnitude Earthquake, derived from the joint CDMG/USGS Probabilistic Seismic Hazard Assessment for the State of California (USGS, 1996).
3. Maximum Intensity derived from ABAG shaking hazard maps (ABAG, 20003).

Source: ESA, 2008.

The Modified Mercalli (MM) intensity scale (Table 3.7-3) is commonly used to measure earthquake effects due to ground shaking. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage.[2] For comparison, the 1906 San Francisco earthquake (Mw 7.9) produced strong (VII) shaking intensities, while the 1989 Loma Prieta earthquake, with an Mw of 6.9 produced moderate (VI) shaking intensities in the Planning Area (ABAG, 2008a, b).

[2] The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. The damage, however, will not be uniform. Some buildings will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance.

Table 3.7-3 Modified Mercalli Intensity Scale

Intensity Value	*Intensity Description*	*Average Peak Acceleration (% g)* [1]
I	Not felt. Marginal and long period effects of large earthquakes.	< 0. 17 g
II	Felt by persons at rest, on upper floors, or favorably placed.	0.17-1.4 g
III	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.	0.17-1.4 g
IV	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.	1.4–3.9 g
V	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.	3.5 – 9.2 g
VI	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle).	9.2 – 18 g
VII	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.	18 – 34 g
VIII	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.	34 – 65 g
IX	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.	65 – 124 g
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.	> 124 g
XI	Rails bent greatly. Underground pipelines completely out of service.	> 1.24 g
XII	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.	> 1.24 g

1. g (gravity) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

Source: ABAG, 2003

San Andreas Fault

The San Andreas fault is located approximately 42 miles west of the Planning Area and is designated by the Alquist-Priolo Earthquake Fault Zoning Act as an active fault. The San Andreas Fault Zone was the source of the two major seismic events in recent history that affected the San Francisco Bay region. The 1906 San Francisco earthquake was estimated at M 7.9 and resulted in approximately 170 miles of surface fault rupture. Horizontal displacement along the fault approached 17 feet near the epicenter. The more recent 1989 Loma Prieta earthquake, estimated at M 7.1, resulted in widespread damage throughout the Bay Area. The USGS Working Group on California Earthquake Probabilities estimated there is a 21 percent chance of the San Andreas fault experiencing an earthquake of Mw 6.7 or greater in the next 30 years (USGS, 2003). This fault is not shown on Figure 3.7-3 due to the distance from the Planning Area.

Hayward Fault

The Hayward fault is located approximately 24 miles west of the Planning Area and is designated by the Alquist-Priolo Earthquake Fault Zoning Act as an active fault. A characteristic feature of the Hayward fault is its well-expressed and relatively consistent fault creep. Although large earthquakes on the Hayward fault have been rare since 1868, slow fault creep has continued to occur and has caused measurable offset. Fault creep on the East Bay segment of the Hayward fault is estimated at 9 millimeters per year (USGS, 1996). However, a large earthquake of about Mw 7.1 could occur on the Hayward fault. The USGS Working Group on California Earthquake Probabilities estimated there is a 27 percent chance of the Hayward fault experiencing an earthquake of Mw 7.1 or greater in the next 30 years (USGS, 2003). This fault is not shown on Figure 3.7-3 due to the distance from the Planning Area.

Calaveras Fault

The Calaveras fault is located approximately 18 miles southwest of the Planning Area and is designated by the Alquist-Priolo Earthquake Fault Zoning Act as an active fault. The Calaveras fault generally trends along the eastern side of the East Bay Hills, west of San Ramon Valley, and extends into the western Diablo Range, and eventually joins the San Andreas Fault Zone south of Hollister. The Calaveras fault has been the source of numerous moderate magnitude earthquakes, and the probability of a large earthquake (greater than Mw 6.8) to occur along the fault in the next 30 years is estimated at 11 percent (USGS, 2003).

Concord-Green Valley Fault Zone

The Concord and Green Valley faults are part of the larger San Andreas Fault System. The Concord fault extends from the northwestern slope of Mount Diablo north to Suisun Bay, where the Green Valley fault is generally thought to be connected to the Concord fault and continues north to Wooden Valley in Napa County. The Concord-Green Valley fault zone is located approximately 11 miles west of the Planning Area. This fault zone is judged capable of generating a maximum earthquake of Mw 6.7.

Clayton-Marsh Creek-Greenville Fault

The Clayton-Marsh Creek-Greenville fault extends along the base of the Altamont Hills, which form the eastern margin of the Livermore Valley. The fault is recognized as a major structural feature and has demonstrated activity in the last 11,000 years. The Clayton-Marsh Creek-

Greenville fault is located approximately 7 miles west of the Planning Area. This fault is judged capable of generating a maximum earthquake of Mw 6.9.

Mount Diablo Thrust Fault

The Mount Diablo Thrust fault is located approximately 11 miles southwest of the Planning Area but is not zoned under the Alquist-Priolo Earthquake Fault Zoning Act since it does not exhibit surficial displacement. This fault is judged capable of generating a maximum earthquake of Mw 6.7.

Rodgers Creek

The Rodgers Creek fault is an important branch of the larger San Andreas Fault system and is generally thought to be connected to the Hayward fault on the south side of San Pablo Bay. The Rodgers Creek fault is located in Sonoma County and is zoned under the Alquist-Priolo Earthquake Fault Zoning Act from Windsor Creek on the north almost to San Pablo Bay (Hart, 1998). The Rodgers Creek fault is approximately 36 miles northwest from the Planning Area and is judged capable of generating a maximum earthquake of Mw 7.0. This fault is not shown on Figure 3.7-3 due to the distance from the Planning Area.

Antioch Fault

The Antioch fault is mapped less than one (1) mile northeast of the Planning Area. The Antioch fault, mapped in 1973 after a pattern of property damage was noted, previously was considered active and was zoned under the Alquist-Priolo Earthquake Fault Zoning Act as potentially capable of surface rupture. However, a 1992 study by geologist C.J. Wills suggested that the Antioch fault should not be classified as active under the Alquist-Priolo Act and does not pose a surface-faulting hazard (Contra Costa Times, 2008). The fault is no longer zoned by the State of California as an earthquake fault zone under the Alquist-Priolo Act.

Highly calichefied surface soils were observed by TerraSearch, Inc. staff in the northwestern portion of the Planning Area in September 2008. Sometimes fault zones act as impermeable layers and accumulated water deposits calcium-rich mineral salts in the soils over the years. The presence of calichefied soil may or may not be related to the Antioch Fault (Terrasearch, Inc., 2008).

Seismic and Geologic Hazards

Ground Shaking

Strong ground shaking from a major earthquake could affect the Planning Area during the next 30 years. An earthquake on any one of the active faults could potentially produce a range of ground shaking intensities at the Planning Area. Ground shaking may affect areas hundreds of miles distant from the earthquake's epicenter. Historic earthquakes have caused strong ground shaking and damage in the San Francisco Bay Area. The 1906 San Francisco earthquake, estimated at M 7.9, produced light (MM V) to moderate (MM VI) shaking intensities in the Planning Area (ABAG, 2008a). The most recent major earthquake in the Bay Area was the M 6.9 Loma Prieta earthquake on the San Andreas fault in October 1989. The Loma Prieta earthquake caused strong ground shaking for about 20 seconds and resulted in varying degrees of structural damage as far as 50 miles away from the epicenter. This event produced light (MM V) shaking intensities in the Planning Area (ABAG, 2008b).

The common way to describe ground motion during an earthquake is the duration of the shaking. However, a common measure of ground motion is also the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the equivalent acceleration of gravity (g), which is approximately 980 centimeters per second squared. (In terms of automobile acceleration, one "g" of acceleration is a rate of increase in speed equivalent to a car accelerating from a standstill to 60 mph in less than 3 seconds.) For comparison purposes, the maximum peak acceleration value recorded during the Loma Prieta earthquake was in the vicinity of the epicenter, near Santa Cruz, at 0.64 g. The lowest values recorded were 0.06 g in the bedrock on Yerba Buena Island. However, an earthquake on the San Andreas fault would likely produce more severe ground shaking than was observed during the Loma Prieta earthquake if the epicenter were closer in vicinity to the Planning Area. Probabilistic seismic hazard maps indicate that peak ground acceleration in the project region could reach or exceed 0.41g (USGS, 1996).

The intensity of ground shaking that would occur at the Planning Area as a result of an earthquake in the Bay Area is partly related to the size of the earthquake, it's distance from the site, and the response of the underlying geologic materials. A large earthquake on the Concord-Green Valley fault is projected to produce the maximum ground shaking intensities in Antioch with MM IX in Bay Mud deposits along the Suisun Bay, north of State Route 4. MM IX is associated with damage to buried pipelines and partial collapse of poorly-built structures. Strong ground shaking of MM VII would occur locally along creek beds in inland portions of Antioch and throughout the majority of the City. MM VII on the Modified Mercalli scale is associated with nonstructural damage. A large earthquake on the Hayward fault is projected to produce ground shaking intensities of MM VIII along the Suisun Bay, north of State Route 4, and less intense ground shaking in Upland Areas (City of Antioch, 2003).

New construction in Antioch is required to meet the requirements of the California Building Code. Buildings of special occupancy are required by the State to meet more stringent design requirements than the UBC. Special occupancy buildings include hospitals, schools, and other structures that are important to protecting health and safety in the community (City of Antioch, 2003).

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults, which are referenced in Table 3.7-2.

The Planning Area is not within an Alquist-Priolo Fault Rupture Hazard Zone, as designated through the Alquist-Priolo Earthquake Fault Zoning Act, and no mapped active faults are known to pass through the immediate project region. The Antioch fault, which is located less than 1 mile northeast of the Planning Area, was previously considered active and zoned under the Alquist-Priolo Earthquake Fault Zoning Act but is no longer considered active nor considered to pose a surface-faulting hazard. Although surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Earthquake Fault Zone, the potential risk of surface rupture is highest along recognized active faults. Thus, the risk of ground rupture at the Planning Area is considered low.

Liquefaction

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment to a fluid-like state caused by seismic ground shaking. Soils susceptible to liquefaction include saturated loose to medium dense sands and gravels, low-plasticity silts, and some low-plasticity clay deposits. Liquefaction and associated failures could damage foundations, disrupt utility service, and can cause damage to roadways.

Liquefaction susceptibility maps prepared by the Association of Bay Area Governments (ABAG), which show areas with water-saturated sandy and silty materials, indicate the Planning Area has a liquefaction hazard of low to high (ABAG, 2007a). The area northeast of East Antioch Creek is mapped as having moderate liquefaction susceptibility, the East Antioch Creek corridor is mapped as a high susceptibility zone, and the portion of the site located southwest of the East Antioch Creek corridor is mapped as a low susceptibility zone. The southernmost edge of the Planning Area is mapped as having very low liquefaction susceptibility, which coincides with the location of sedimentary deposits of the Tulare Formation.

Preliminary soil investigations were conducted by Terrasearch, Inc. in September 2008. Five borings were drilled north of East Antioch Creek in areas of sandy near-surfaces soils. The borings indicated that there are approximately 18 feet of medium dense sand over clay to 50 feet depth. No groundwater was encountered within 20 feet depth. However, if groundwater were to rise to the surface, liquefaction of loose sands may result (Terrasearch, Inc., 2008).

Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. Soft, water-saturated loose sands and soft, clay-rich sediments care subject to differential settlement. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, non-compacted, and variable sandy sediments) due to the rearrangement of soil particles during prolonged ground shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments. It is possible that the Planning Area could be subjected to earthquake-induced settlement, particularly in the sandy soils located northeast of East Antioch Creek.

Soil Erosion

Soil erosion is the process by which soils are worn away from the earth's surface by precipitation and runoff or wind. The rate of erosion depends on many factors, including soil type and geologic parent materials (inherent erodibility), degree of surface disturbance and resulting vegetative cover and degree of compaction, degree and length of slope, rainfall and/or wind amount and intensity, and erosion control practices. Soils that are high in silt and low in clay and organic matter are the most inherently erodible; but, regardless of soil texture, erosion potential may be high in steep, unvegetated areas-especially those areas disturbed by cut-and-fill or other construction activities. As indicated in Table 3.7-1, site soils are characterized as having a low to moderate hazard of erosion.

Landslides

Slope failures, commonly referred to as landslides; include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or

dynamic (i.e., earthquake) forces. A slope failure is a mass of rock, soil, and debris displaced downslope by sliding, flowing, or falling. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience shallow soil slides, rapid debris flows, and deep-seated rotational slides. Landslides may occur on slopes of 15 percent or less; however, the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and transverse ridges. Landslide-susceptible areas are characterized by steep slopes and downslope creep of surface materials. Debris flows consist of a loose mass of rocks and other granular material that, if saturated and present on a steep slope, can move downslope. The rate of rock and soil movement can vary from a slow creep over many years to a sudden mass movement. Landslides occur throughout the state of California, but the density of incidents increases in zones of active faulting.

Maps prepared by ABAG depicting the distribution of existing landslides show that the majority of the Planning Area is classified a "Flatland," with the exception of the southernmost edge of the Planning Area, between SR 4 and the Union Pacific Railroad tracks, which is mapped as "Few Landslides" and corresponds with the sedimentary deposits of the Tulare formation (ABAG, 2007b). The hills in the southernmost portion of the Planning Area, which range from 15 to 30 percent slope, may be susceptible to landslide and slope instability hazards.

Preliminary test pit investigations in the southeastern portion of the Planning Area indicate that the sandstone and claystone hills have bedrock with bedding attitudes that range from 10 degrees to 20 degrees to the north. This means that any north facing cut slopes inclined at 2:1 (horizontal to vertical) will have the potential for instability (Terrasearch, Inc., 2008).

Differential Settlement

Settlement is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. Soils tend to settle at different rates and by varying amounts depending on the load weight or change in properties over an area, which is referred to as differential settlement. Differential settlement of the loose soils generally occurs slowly, but over time can amount to more than most structures can tolerate. If not properly engineered, loose, soft, soils comprised of sand, silt, and clay have the potential to settle after a building or other load is placed on the surface. Differential settlement can damage buildings and their foundations, roads and rail lines, and result in breakage of underground pipes. It is possible that the Planning Area could be subjected to differential settlement, particularly in the sandy soils located northeast of East Antioch Creek.

Expansive Soils

Expansive soils possess a "shrink-swell" behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage to buildings can occur over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Site soils northeast of East Antioch Creek have been characterized as having a low expansion potential, or shrink-swell behavior. Site soils northwest of East Antioch Creek have been characterized as having a moderate to high expansion potential.

Subsidence

Land surface subsidence can result from both natural and man-made phenomena. Natural phenomena include subsidence resulting from tectonic deformations and seismically induced settlements (see liquefaction); soil subsidence due to consolidation; subsidence due to oxidation or dewatering of organic-rich soils; and subsidence related to subsurface cavities. Subsidence or settlement related to human activities includes subsidence caused by decreased pore pressure due to the withdrawal of subsurface fluids, including water and hydrocarbons. Planning Area soils are considered susceptible to subsidence.

Ultramafic or Asbestos-Containing Soils

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. Serpentinite may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite, may also contain asbestos minerals. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and is considered a toxic air contaminant by the California Air Resources Board (CARB).There are no mapped ultramafic or asbestos-containing soils in the Planning Area.

REGULATORY SETTING

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The Alquist-Priolo Act regulates development on or near active fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces.[3] Cities and counties must regulate certain development projects within the delineated zones, and regulations include withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture, however, is not necessarily restricted to the area within an Alquist-Priolo Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides, and its purpose is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, and other ground failure, and other hazards caused by earthquakes. The Act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. As of October 2008, 22 official seismic hazard zone maps for the San Francisco Bay Area showing areas prone to

[3] A "structure for human occupancy" is defined by the Alquist-Priolo Act as any structure used or intended for supporting or sheltering any use or occupancy that has an occupancy rate of more than 2,000 person-hours per year.

liquefaction and landslides have been released, and additional maps for Contra Costa County are planned or in progress. None of the current maps encompass the City of Antioch (CGS, 2004).

California Building Code

The *California Building Code* is certified in the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Published by the International Conference of Building Officials, the Uniform Building Code (UBC) is a widely adopted model building code in the United States. The California Building Code incorporates by reference the UBC with necessary California amendments. About one-third of the text within the California Building Code has been tailored for California earthquake conditions. Although widely accepted and implemented throughout the United States, local, City and county jurisdictions can adopt the UBC either in whole or in part.

Local Regulations

Hillside Planned Development Ordinance

The City of Antioch has a Hillside Planned Development (HPD) Ordinance to protect hillsides, ridges, and ridgelines within the City (City of Antioch, 2003). The HPD Ordinance was revised and adopted in 1994 as part of the Zoning Ordinance and applies to those hillside areas in which one or more of the following apply:

- A predominant portion of the area has slopes in excess of 10 percent;
- A significant area of slopes of 25 percent or greater; or
- A significant ridgeline, hilltop, or exposed slope is located in the area.

The HPD Ordinance does not apply as the site does not meet any of the criteria listed above and no HPD Districts have been defined within the Planning Area.

City of Antioch Municipal Code

Title 8, Chapter 1, Section 8 of the City of Antioch Municipal Code establishes that all building permit applications must comply with the structural requirements of the California Building Code, as well as other pertinent laws and ordinances of the city or any other governmental body having jurisdiction over the city.

Title 9, Chapter 4, Article 5 of the City of Antioch Municipal Code requires that building permit applications for new development must be accompanied by a preliminary soils report that characterizes the soil qualities of the proposed development area. If the preliminary soil report indicates the presence of soil problems which, if not corrected, could lead to structural defects, a soil investigation must be prepared that recommends corrective actions to prevent structural damage where such soil problems exist. Soil investigations are approved by the City Engineer, and the building permit is conditioned upon the incorporation of the approved recommended corrective action in the construction.

City of Antioch General Plan

The Environmental Hazards element of the City of Antioch General Plan contains a variety of recommendations for the prevention of damage and injury or death from geologic and seismic hazards. Ensuring public safety involves establishing goals and policies that consider all types of potential disasters and reducing the risk of personal injury and potential property damage.

11.3.2 Geology and Seismicity Policies

a. Require geologic and soils reports to be prepared for proposed development sites, and incorporate the findings and recommendations of these studies into project development requirements. As determined by the City of Antioch Building Division, a site-specific assessment shall be prepared to ascertain potential ground shaking impacts on new development. The site-specific ground shaking assessment shall incorporate up-to-date data from government and non-government sources and may be included as part of any site-specific geotechnical investigation. The site-specific ground shaking assessment shall in-clude specific measures to reduce the significance of potential ground shaking hazards. This site-specific ground shaking assessment shall be prepared by a licensed geologist and shall be submitted to the City of Antioch Building Division for review and approval prior to the issuance of building permits. For purposes of this policy, "development" applies to new structures and existing structures or facilities that undergo expansion, remodeling, renovation, refurbishment or other modification. This policy does not apply to second units or accessory buildings.

b. Provide information and establish incentives for property owners to rehabilitate existing buildings using updated construction techniques to protect against seismic hazards.

c. Encourage the purchase of earthquake insurance by residents and businesses.

d. Encourage continued investigation by State agencies of geologic conditions within the Bay Area to update knowledge of seismic hazards and promote public awareness.

e. Provide expedited review of any seismic- related revisions to the Uniform Building Code proposed by the State.

f. Work with PG&E, pipeline companies, and industrial uses to implement measures to safeguard the public from seismic hazards associated with high voltage transmission lines, caustic and toxic gas and fuel lines, and flammable storage facilities.

g. Require that engineered slopes be designed to resist seismically-induced failure.

h. Require that parcels overlying both cut and fill areas within a grading operation be over-excavated to mitigate the potential for seismically-induced differential settlement.

i. Limit development in those areas, which, due to adverse geological conditions, will be hazardous to the overall community and those who will inhabit the area.

j. Require evaluations of potential slope stability for developments proposed within hillside areas, and incorporate the recommendations of these studies into project development requirements.

k. Require specialized soils reports in areas suspected of having problems with potential bearing strength, expansion, settlement, or subsidence, including implementations of the recommendations of these reports into the project development, such that structures de-signed for human occupancy are not in danger of collapse or significant structural damage with corresponding hazards to human occupants. Where structural damage can be mitigated through structural design, ensure that potential soils hazards do not pose risks of human injury or loss of life in outdoor areas of a development site.

l. Where development is proposed within an identified or potential liquefaction hazard area (as determined by the City), adequate and appropriate measures such as (but not limited to) designing foundations in a manner that limits the effects of liquefaction, the placement of an engineered fill with low liquefaction potential, and the alternative siting of structures in areas with a lower liquefaction risk, shall be implemented to reduce potential liquefaction hazards. Any such measures shall be submitted to the City of Antioch Building Division for review prior to the approval of the building permits.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact if the Plan would:

Geology

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction;
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

Mineral Resources

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

METHODOLOGY AND ASSUMPTIONS

This impact analysis focuses on potential effects on geology, soils, and seismicity associated with transit-oriented residential and commercial development in the Planning Area as proposed under the Hillcrest Station Area Specific Plan. The evaluation is based on review of project plans, applicable regulations and guidelines, and review of published geologic, soils, and seismic maps and studies.

SUMMARY OF IMPACTS

Because the Planning Area is not located within an Earthquake Fault Hazard Zone, the risk of surface fault rupture at the Planning Area is considered low. Potential geologic and soils impacts to proposed structures and infrastructure are primarily related to ground shaking and associated ground failure (e.g., liquefaction), soil expansion, settlement, and subsidence. Potential slope instability hazards are present in the hilly areas in the southernmost portion of the Planning Area, between SR 4 and the Union Pacific Railroad tracks. The potential for soil erosion would increase during construction, but would be addressed by mandatory compliance with existing regulations. As no significant mineral resource areas exist within or in the vicinity of the Planning Area, no impact related to the loss of availability for mineral resources would result.

IMPACTS AND MITIGATION MEASURES

3.7-1 *Proposed development in the Planning Area could expose people or structures to surface fault rupture. (Less than Significant)*

The Planning Area is not located within an Alquist-Priolo Earthquake Fault Zone, and no active or potentially active faults exist on or in the immediate vicinity of the site. The Antioch fault, located less than 1 mile northeast of the Planning Area, is no longer considered active nor considered to pose a surface-faulting hazard. The closest known earthquake fault classified as active or potentially active (Clayton-Marsh Creek-Greenville) is located approximately 7 miles west of the Planning Area. Although surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Earthquake Fault Zone, the potential risk of surface rupture is highest along active faults. Thus, potential impacts related to surface fault rupture would be less than significant.

Mitigation Measures

No mitigation measures are required.

3.7-2 ***Proposed development in the Planning Area could expose people or structures to seismic hazards such as ground shaking or liquefaction. (Less than Significant)***

Ground shaking generated during an earthquake could result in structural damage to structures and project-related infrastructure. Seismic-related ground shaking is an unavoidable hazard in the San Francisco Bay Area. Structures and associated infrastructure proposed under the Hillcrest Station Area Specific Plan would likely experience at least one major earthquake (greater than Richter magnitude 6.7) during their functional lifetime. The degree of hazard depends on the geologic condition of the site, construction materials, and construction quality. The intensity of such an event would depend on the causative fault and distance to the epicenter, the moment magnitude, and the duration of shaking.

Although some structural damage is typically not avoidable, building codes and construction standards established by the California Building Code and contained in Title 24 of the CCR protect against building collapse and major injury during a seismic event. Future development in the Planning Area would be required to meet the requirements of the California Building Code to help prevent extensive structural damage due to seismic-related ground shaking.

Future development in the Planning Area may also be susceptible to secondary seismic hazards such as liquefaction. Soils containing a high percentage of sands are generally most susceptible to liquefaction. Surface soils in the Planning Area range from clay and silty clay loam to fine-grained sand. Liquefaction susceptibility maps prepared by ABAG indicate the Planning Area has a liquefaction hazard of low to high, with the highest hazard along the East Antioch Creek channel and moderate liquefaction hazard in northeast corner of the site, north of the creek. Liquefaction-induced ground failure can result in damage to underground utilities, shallow foundations, and paved areas.

Both the City of Antioch Municipal Code and the City of Antioch General Plan require the preparation of site-specific geologic and soils reports for all new development, and require that the findings and recommendations of these studies be incorporated into project development. These reports must be submitted to the City of Antioch Building Division for review and approval prior to the issuance of building permits, and the building permit conditioned upon the incorporation of the approved recommended corrective action in the construction.

The proposed Plan includes high density development, with building heights ranging from one to eight stories, throughout most of the Planning Area. Development is expected on soils which are expected to significantly amplify ground-shaking. Even though all construction must meet the Uniform Building Codes standards for Seismic Risk Zone 4, there will be new development and new population that will be potentially impacted by ground-shaking and other seismic hazards.

The proposed Plan designates the northeast corner of the Planning Area, where the hazard of liquefaction is considered moderate as high density transit area mixed-use. It is anticipated that as part of the site preparation of this area that significant fill will be added to raise the elevation. Standard practices for placing and compacting fill material should reduce the likelihood of liquefaction and seismically-induced settlement. The area with the highest hazard level of liquefaction, the East Antioch Creek corridor, is designated as open space, which should limit the impact of potential liquefaction and seismically-induced settlement on people and structures.

Existing Policies and Requirements that Reduce the Impact

Mandatory compliance with the building codes and construction standards established in the California Building Code, the requirements of the City of Antioch Municipal Code, and policies contained in the City of Antioch General Plan would reduce seismic-related ground shaking and liquefaction to less than significant levels.

Mitigation Measures

No mitigation measures are required.

3.7-3 ***Implementation of the Hillcrest Station Area Specific Plan could expose proposed structures and infrastructure to geologic hazards, including expansive soils, differential settlement, and subsidence. (Less than Significant)***

Sediments underlying the Planning Area are alluvial soils that range from clay and silty clay loam to fine-grained sand. The composition of these soils is likely to vary over distance and depth. Soil properties will be determined with site-specific investigations. In the northeastern portion of the Planning Area, there are approximately 18 feet of sand over clay to 50 feet depth. The southeastern hills are composed primarily of sandstone and claystone. Until confirmation, it is assumed that proposed structures could be subject to soil expansion, settlement, and subsidence.

Soils containing a high percentage of clays are generally most susceptible to expansion. According to soil survey information provided in the Contra Costa County Soil Survey, soils northeast of East Antioch Creek (DaC) are characterized as having a low expansion potential, or shrink-swell behavior. Soils southwest of East Antioch Creek (ZaA, CaC, LhE, DdE) and the So soils found in the northern portion of the creek are characterized as having moderate to high expansion potential. Expansive soils can damage foundations of aboveground structures, paved roads and streets, and concrete slabs. Due to the nature of site soils, corrective measures to address the potential for expansive soils to increase structural damage will need to be implemented.

If not properly engineered, loose, soft, soils composed of sand, silt, and clay have the potential to settle after a building or other load is placed on the surface. Differential settlement of loose soils would be a concern in areas that have not previously supported structures and where new structures would place loads heavier than the soils could tolerate. Differential settlement can damage buildings and their foundations, roads and rail lines, and result in breakage of underground pipes. In the absence of a site-specific geotechnical investigation, it is assumed that the Planning Area could be subjected to differential settlement, particularly in the sandy soils located northeast of East Antioch Creek.

In the absence of a site-specific geotechnical investigation, the Planning Area is also considered susceptible to land surface subsidence due to consolidation, oxidation, or dewatering of organic-rich soils, and subsidence related to subsurface cavities.

As required by the City of Antioch Municipal Code and the City of Antioch General Plan, at a minimum, building permit applications must be accompanied by a preliminary soils report that characterizes soil properties in the development area. If the preliminary soils report indicates the presence of expansive soils, settlement, and potential for subsidence, a soils investigation report

must be prepared that provides recommendations to offset potential soil problems, and the recommendations must be incorporated into project development.

Existing Policies and Requirements that Reduce the Impact

Mandatory compliance with the City of Antioch Municipal Code and policies contained in the City of Antioch General Plan would ensure impacts related to geologic hazards, such as expansive soils, differential settlement, and subsidence to less-than-significant levels for the proposed Plan.

Mitigation Measures

No mitigation measures are required.

3.7-4 ***Proposed development along the two southernmost hills adjacent to SR 4 could be susceptible to seismically-induced landslides or other slope failures, potentially resulting in damage to structures and private property. (Less than Significant)***

With the exception of the hillside areas along the southern boundary, the surface topography of the Planning Area is relatively level, and potential slope instability hazards are minimal. Hilly areas in the southernmost portion of the Planning Area, between SR 4 and the Union Pacific Railroad tracks, range from 15 to 30 percent slope. Preliminary test pit investigations in the southeastern portion of the Planning Area indicate that the sandstone and claystone hills have bedrock with bedding attitudes that range from 10 degrees to 20 degrees to the north. This means that any north facing cut slopes inclined at 2:1 (horizontal to vertical) will have the potential for instability. (Terrasearch, Inc., 2008) Without proper engineering controls, re-grading and development of this area could result in slope instability, potentially resulting in damage to structures and private property.

Under the proposed Plan, the steep slope areas in the southernmost portion of the Planning Area would be significantly graded to level the topography and allow for transit area mixed-use development. In the absence of a site-specific slope stability analysis, landslide and slope instability hazards under this scenario are considered potentially significant. Compliance with existing regulations and the proposed plan policies would reduce the potential impact to less than significant levels.

Specific Plan Policies that Reduce Impact

EH-30 A slope stability analysis of the hillsides along the southernmost portion of the Planning Area shall be conducted prior to the issuance of any grading permits in this area.

- If slope stability and/or landslides are expected to be an issue, the slope stability analysis shall recommend measures to ensure that future development projects in this area be designed and constructed to avoid seismically-induced landslides or other slope failures. Recommendations can include:
- Requiring that the slope is cut at a flatter angle, such as 2.5:1 or 3:1 for slopes greater than 30 feet high; or,

- Requiring that the slope is excavated and re-built as engineered fill buttress slopes inclined at 2:1 for slopes up to 30 feet high and inclined at 2.5:1 for slopes greater than 30 feet high.
- Detailed grading plans and construction drawings incorporating the recommended measures shall be submitted to the City of Antioch Building Department for approval prior to the issuance of building permits.

Mitigation Measures

No mitigation measures are required.

3.7-5 ***Future development in the Planning Area could result in increased soil erosion. (Less than Significant)***

The USDA Soil Survey for Contra Costa County indicates the hazard of erosion of site soils varies from slight where gently sloping, to moderate in the hilly areas at the southeast portion of the Planning Area.

Erosion hazards would be highest during construction activities. Construction activities such as excavation, backfilling, grading, and demolition can remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized during construction, can be subject to soil loss and erosion by wind and stormwater runoff.

Per the City of Antioch Municipal Code, all construction activities are required to include engineering practices for erosion control. Further, as discussed in Section 3.9, Hydrology and Water Quality, future development projects in the Planning Area would be required to comply with NPDES General Construction Permit requirements. Project applicants would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) to minimize the discharge of pollutants, including silt and sediment, during construction. The SWPPP would need to include measures to control erosion and effectively manage runoff and retain sediment on-site during construction.

Under the proposed Plan, the steep slope areas in the southernmost portion of the Planning Area would be significantly graded to level the topography and allow for transit area mixed-use development. The hazard of erosion in the southernmost portion of the Planning Area is characterized as moderate, and could be exacerbated by grading activities during construction. However, compliance with existing policies and regulations would reduce the impact to less than significant levels.

Existing Policies and Requirements that Reduce Impact

Mandatory compliance with the City of Antioch Municipal Code and NPDES General Construction Permit requirements would reduce impacts related to erosion hazards to less-than-significant levels.

Mitigation Measures

No mitigation measures are required.

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3.8 Hazardous Materials and Safety

This section presents the environmental setting, impact analysis, and mitigation measures for safety and hazardous materials within the Hillcrest Station Area Specific Plan area. Hazardous materials conditions, wildland fire hazards, high-pressure pipeline hazards, and emergency response planning with the potential to affect human health and the environment are described. As the Planning Area is not located within an airport land use plan, near a private airstrip, or within two miles of an airport, these safety considerations are not evaluated in this section. In addition, there is no indication that the proposed Specific Plan or pursuant development would interfere with the implementation of the Antioch Emergency Plan, so the potential impacts have not been evaluated.

ENVIRONMENTAL SETTING

Past and present land uses at the Planning Area comprise a variety of uses including industrial, utility, residential, and agricultural uses. Activities associated with these land uses may pose potential environmental, health, and safety risks. These risks include accidents involving vehicles transporting hazardous materials or hazardous wastes, accidental spills or leaks, and improper use, handling, storage, transport, and disposal of hazardous materials. For the purposes of this analysis, *hazardous materials* are the toxic raw materials that go into production, and *hazardous waste* is the waste generated by facilities and businesses or waste material remaining on-site as a result of past activities.

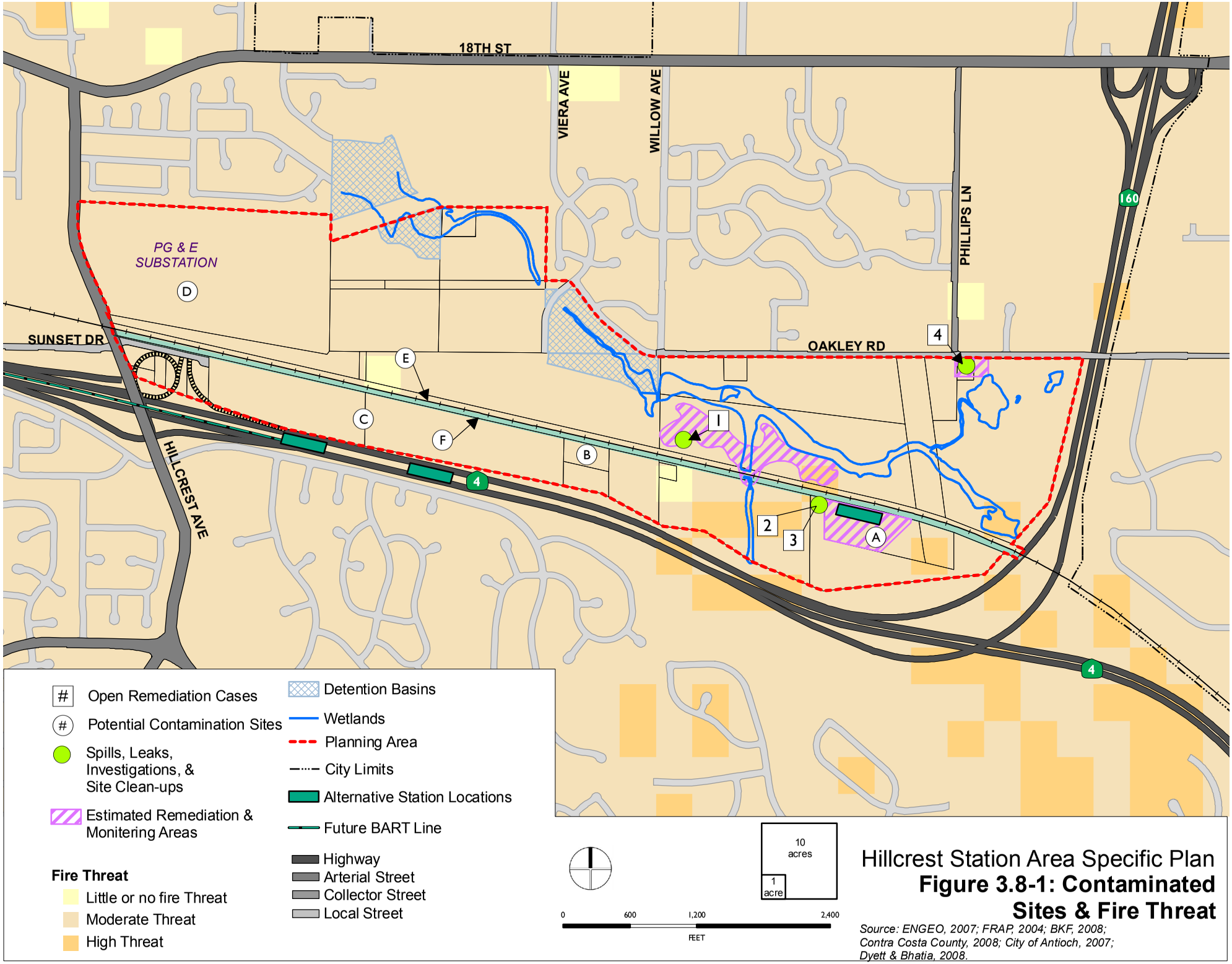
PHYSICAL SETTING

Hazardous Materials

Properties in which historic or on-going activities have resulted in a reported release of hazardous materials into soil and groundwater are shown on Figure 3.8-1. It is important to note that listed properties do not necessarily represent a potential risk to human health unless otherwise specified.

Contaminated Sites

A search of regulatory agency databases listing hazardous material sites in and near the Planning Area confirmed the findings of a Phase One Environmental Site Assessment (ESA) report published in conjunction with the proposed development of the property by Engeo Incorporated in October 2007. (Engeo Inc., 2007) The report concludes that based on site reconnaissance and records review there is evidence of significant soil and groundwater contamination in the Planning Area. Groundwater monitoring is on-going on multiple parcels. Known and potentially contaminated sites within the Planning Area are listed in table 3.8-1 and mapped on Figure 3.8-1.



Hillcrest Station Area Specific Plan

Figure 3.8-1: Contaminated Sites & Fire Threat

Source: ENGEO, 2007; FRAP, 2004; BKF, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.

Table 3.8-1 Contaminated Sites

Open Remediation Case Sites	*Potential Contamination Sites*
1 - Former Hickson-Kerley (FKP) Property	A - PDQ Products
2 - Chevron Old Valley Pipeline	B - Esver Property
3 - TAOC New Love Pump Station Site	C - Former Orchards
4 - PG&E Oakley Metering Station	D - PG&E Substation
	E - Railroad Right-of-Way
	F - Petroleum Pipeline Alignments

Source: Engeo, 2008.

1. Former Hickson-Kerley (FKP) Property (Spills, Leaks, Investigations and Clean-ups, SLIC)

The FKP site is 153 acres of mostly undeveloped land. An agricultural chemical/fertilizer and Zinkite manufacturing facility was operated on seven acres (APN: 052-051-034) between 1962 and 1995. The site included a pond which received stormwater runoff from the manufacturing plant. The buildings were demolished when manufacturing ceased. The tanks and piping were removed in 1996. After demolition, between 1996 and 1999, extensive site characterization, interim soil remediation, and groundwater investigation activities were conducted under the oversight of the Contra Costa County Health Services Development and the California Regional Water Quality Control Board (RWQCB).

Groundwater monitoring wells and extraction wells were installed in 1999 and 2000. The extraction wells discharge directly to the Delta Diablo Sanitation District under Special Discharge Permit SDP-0606-778. Groundwater monitoring and extraction continues to date. The extraction system has been shown to be effective in the mass reduction of ammonia, sulfates, nitrates, and manganese. The property owner requested discontinuance of the Groundwater Monitoring and Reporting Program in March 2005; however, the RWQCB has required continued monitoring and extraction.

2. Chevron Old Valley Pipeline (OVP) (SLIC)

Six active or former petroleum pipelines are located within and parallel to the Union Pacific Railroad right-of-way (UP ROW). One of these pipelines is ChevronTexaco's predecessor pipeline, commonly referred to as the Old Valley Pipeline (OVP) that transported heavy petroleum (crude oil and Bunker C fuel oil). Soil and groundwater investigations on the FKP property revealed the presence of petroleum-based products in the soil and groundwater attributable to releases from the pipelines. Numerous investigations have been conducted starting in 1995, including soil borings and the installation of groundwater monitoring wells. The case is under the oversight of the RWQCB. Groundwater monitoring was conducted intermittently between 1995 and 2001, and quarterly monitoring and sampling began in February 2002. Groundwater monitoring was reduced to semi-annual events starting in February 2007, and a revised monitoring and reporting plan for the site was subsequently issued by RWQCB.

Chevron is currently conducting additional investigative work to delineate the western extent of the petroleum hydrocarbon plume. Chevron will be preparing a health risk assessment and a soil/groundwater management plan to address future development on and near the site. Chevron

has acknowledged responsibility for the noted contamination and associated regulatory compliance.

3. TAOC New Love Pump Station Site

The Tidewater Associated Oil Company (TAOC) New Love Pump Station was used as a booster/heater station to heat crude oil for transport from the San Joaquin Valley to refineries in the San Francisco Bay Area. A 1916 topographic map indicates that the pump station was constructed between 1908 and 1916. The pump station operated through the 1960s and was decommissioned sometime during the 1970s. The pump station equipment consisted of pumps, heaters, boilers, aboveground storage tanks (ASTs) and associated piping, repair/maintenance shops, and cottages. The ASTs consisted of one 10,000-barrel tank, one approximately 15,000-barrel tank, two 30,000-barrel tanks, and one 55,000-barrel tank. A valve manifold connected the TAOC pipelines to the boiler/pump house and ASTs. Historical site drawings and aerial photographs show a sump area across the Union Pacific Railroad right-of-way that appears to have served as wastewater storage or discharge. This historic sump is adjacent to a seasonal creek on parcel APN 052-051-034.

Chevron commissioned 22 soil borings (SB-1 through SB-29) at the TAOC New Love Pump Station in January 2008. The investigation was conducted under the oversight of the RWQCB. Detectable concentrations of petroleum hydrocarbons were reported in 33 of the 51 soil samples analyzed. Concentrations of TPH were also detected in nine groundwater samples submitted from 11 borings.

Chevron is currently conducting an additional investigation to further evaluate the extent of groundwater impacts. The RWQCB has not required further assessment of the extent of soil impacts. Chevron will be preparing a health risk assessment and a soil management plan to address future grading and development. Chevron has acknowledged responsibility for the noted contamination and associated regulatory compliance.

4. PG&E Oakley Metering Station (SLIC)

The former 0.69-acre PG&E facility is located near the intersection of Oakley Road and Phillips Lane (APN: 052-051-035). PG&E used the site during the 1970s as a metering station for natural gas being transported by pipeline to nearby gas processing facilities. In 1991, soils and groundwater impacted with petroleum hydrocarbons and PCBs were detected.

Extensive site characterization and remedial efforts have been conducted under the oversight of the RWQCB. Groundwater extraction wells and vapor extraction wells were installed on the site. Separate-phase hydrocarbon removal was initiated in August 1993 in selected wells using an in-well product removal system, passive product recover devices, and manual bailing. In 1997, a groundwater extraction and treatment system (GWETS) and a soil vapor extraction system (SVE) were installed to address the subsurface contamination.

Groundwater monitoring continues, including sampling conducted in March 2008 and July 2008. Residual groundwater impacts were found to be limited in extent and generally confined off-site to the north of the PG&E-owned parcel. A Remedial Process Optimization (RPO) report was submitted in April 2008. Three key findings from the RPO report were recommended: 1) optimize the GWETS, 2) formally shut down the SVE, and 3) conduct an air-sparging pilot test. In August 2008, RWQCB requested a work plan from PG&E due by October 30, 2008. The work plan will

include an air sparging pilot study and evaluation of soil vapor for additional evaluation of the formal SVE shut-down; additional lateral and vertical delineation of the contaminant plume; and an evaluation of the effectiveness of wells with submerged well screens.

No human health risks have been identified in association with the soil and groundwater impacts in this area. Groundwater monitoring and remediation will be continued until remedial objectives have been achieved. PG&E has acknowledged responsibility for the noted contamination and associated regulatory compliance.

Contamination Potential on Other Sites

A. PDQ Products

Until January 2008, this facility had been processing primarily scrap metal for resale for the last 20 years (APN: 052-052-002). The primary operations included processing and packaging of aluminum, aluminum oxide, and zinc. The operations do not involve hazardous materials, but the facility inventory listed compressed welding gas, one above ground, 500-gallon diesel storage tank, and minor used motor oil. Before PDQ Products was located here, another commercial/industrial activity had large above-ground oil storage tanks on site, and other previous uses may have impacted the soils or groundwater. However, no references to soil or groundwater impacts were noted in the Contra Costa County Health Services files. A subsurface soil and groundwater assessment should be performed on this parcel to evaluate for the presence of petroleum hydrocarbon, polycyclic aromatic hydrocarbons (PAHs), and metals.

B. Esver Property

The Esver property, APN 052-030-015, is currently developed with a residence and several out-structures. Based on a review of historical topographic maps and aerial photographs, the parcel has consisted of a residence since the early 1960s. The parcel is shown as undeveloped prior to the 1960s. The site reconnaissance and records review did not find documentation or physical evidence of soil or groundwater impairments associated with the current or past use of the Esver parcel. A review of regulatory databases maintained by county, state, tribal, and federal agencies found no documentation of hazardous materials violations or discharge associated with the parcel. Based on the findings of this assessment, no Recognized Environmental Conditions (RECs) and no historical RECs were identified for the parcel.

C. Former Orchard

More than 100 acres of the 268 acres evaluated in the Phase One ESA were cultivated as orchard. A previous agrichemical assessment of parcels 051-170-003 and 051-170-052 found no evidence of environmental impacts associated with agricultural uses. The Phase One ESA indicates that other similar agriculture uses have not significantly impacted the soils and groundwater. However, if sensitive land uses, such as residential development, are planned, an agrichemical impact assessment should be considered. The assessment should include analyzing near-surface soil samples for organochlorine pesticides, arsenic, and lead.

D. PG&E Substation

The Hillcrest Avenue Yard and Substation in the northwest corner of the Planning Area has been in place since the 1950s. This site is not currently listed as contaminated, but it is feasible that the site has soil and/or groundwater impacted with petroleum hydrocarbons and PCBs. If sensitive

land uses, such as residential development are planned for the area abutting the PG&E property, a limited soil and groundwater sampling program should be undertaken to determine the presence of hydrocarbons and PCBs.

E. Railroad Right-of-Way

The soil surrounding the Union Pacific Railroad ROW may be impacted with metals, petroleum hydrocarbons, or other contaminants. If sensitive land uses, such as residential development, are planning for the area proximate to the railway alignment, or if significant earth movement is to occur within the right-of-way, a near-surface soil sampling program should be considered to evaluate for metals, PAHs, and petroleum hydrocarbons.

F. Petroleum Pipeline Alignments

Former and active petroleum pipeline easements exist throughout the Planning Area. To date, soil and groundwater investigations associated with the petroleum pipelines have been limited to the area around the FKP property. Given the number and length of the pipeline easements within the Planning Area, it is conceivable that other undetected areas of contaminated soil and/or groundwater may exist along the alignment. If sensitive land uses, such as residential development, are planned for the area proximate to the pipelines, the Phase One ESA recommends a soil and groundwater subsurface assessment to evaluate for the presence of petroleum hydrocarbons, BTEX (benzene, toluene, ethylbenzene, and xylenes), and PAHs.

Outside Planning Area

Outside the Planning Area, a number of sites have been identified as having existing or prior use of hazardous materials. These sites have been identified on a variety of databases, including, but not limited to, the California EPA Geotracker database, US EPA Envirofacts Data Warehouse, Cortese Hazardous Waste and Substances Sites List, Leaking Underground Storage Tank Incident Reports, Department of Toxic Substances Control's Site Mitigation and Brownfields Reuse Program's EnviroStor databases. The sites are primarily registered, historic, and leaking underground fuel tanks. There are also recycling facilities, former agricultural sites, power plants, and other industrial facilities that handle small amounts of hazardous materials. These offsite facilities are not expected to affect the Planning Area and are not mapped on Figure 3.8-1.

Hazardous Building Materials

Based on study of an aerial photograph from 2004, there are approximately 17 structures within the Planning Area. Seven of the structures, including four at the PDQ facility, were built prior to 1972. There is a high probability that these structures were built with hazardous building components such as asbestos, lead-based paint, and/or polychlorinated biphenyls (PCBs).

Urban/Wildland Fire Interface

Based on the existing conditions of the Planning Area, the California Fire and Resource Assessment Program (FRAP) 2004 maps indicate that 95 percent of the area has a moderate fire threat. (Cal FIRE, 2007) Fire threat is determined based on the combination of potential fire behavior and expected fire frequency. Most large urbanized areas receive a moderate fire threat classification to account for fires carried by ornamental vegetation and flammable structures. Fire threat areas are mapped on Figure 3.8-1.

Table 3.8-2 Planning Area Fire Threat

Threat Level	*Acres*	*Percent of Area*
Little to no	5	1%
Moderate	355	95%
High	15	4%

Source: FRAP, 2004.

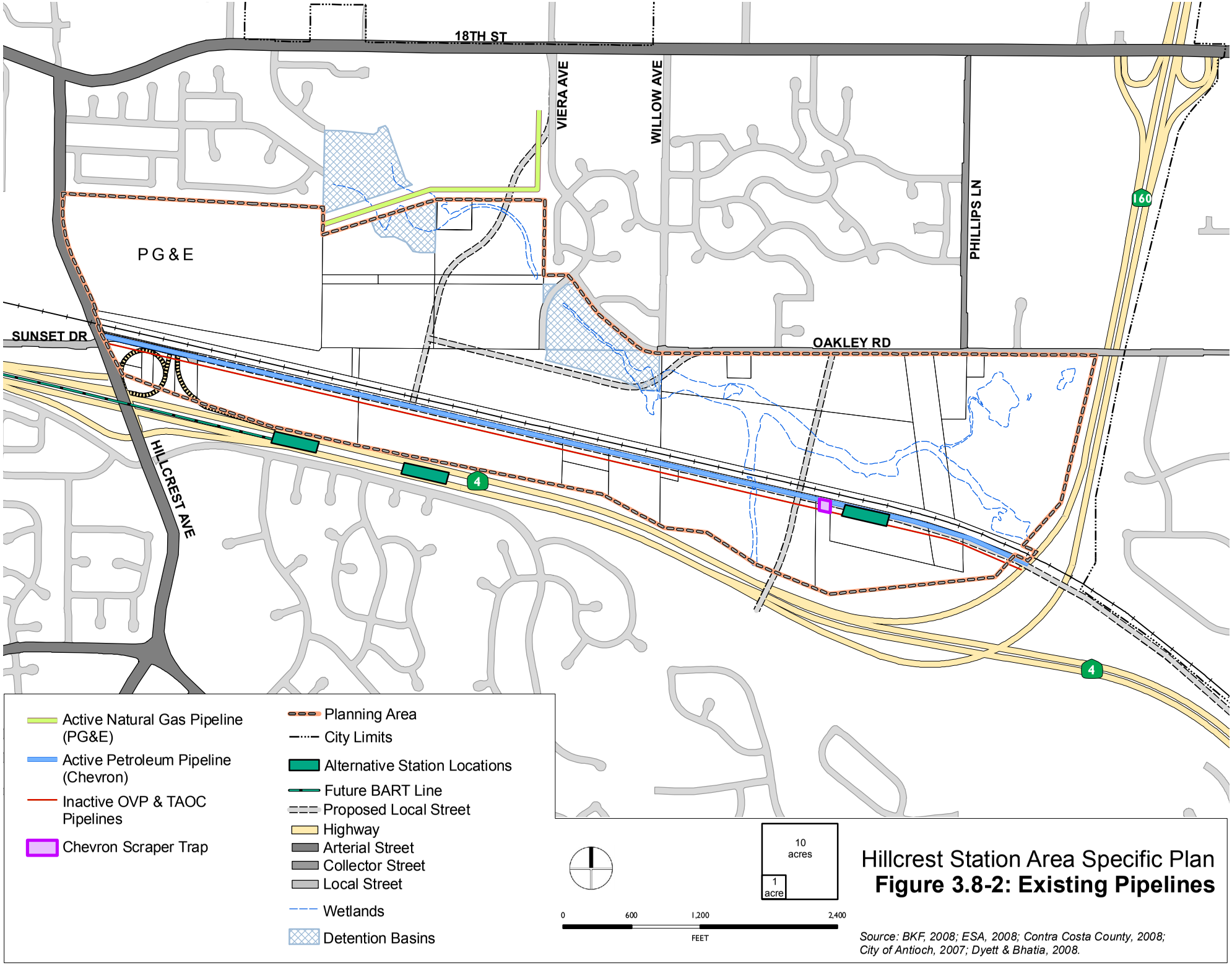
The Fire Hazard Severity Zones (FHSZ) are used by building officials to determine appropriate construction materials for new buildings and by property owners to comply with natural hazards disclosure requirements. (Cal FIRE, 2007) These maps are created using data and models describing development patterns, potential fuels over a 30-50 year time horizon, expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure to new construction. The 2007 Draft FHSZ for Contra Costa County were generated based on expected land uses; therefore, the majority of the Planning Area is considered urban, with only a small portion, about 21 acres, having a moderate fire hazard. This area corresponds to the existing grassy hillsides along SR 4 in the southeast part of the Planning Area.

High-Pressure Pipelines

Virtually all natural gas and two-thirds of petroleum products are transported by transmission pipelines, which make up 20 percent of the 1.8 million total miles of pipelines in the United States. Transportation of energy fuels via transmission pipelines is safer than transportation via other modes, but a significant failure can result in loss of life, personal injury, property damage, and environmental damage. There are many causes and contributors to pipeline failures, including construction errors, material defects, internal and external corrosion, operational errors, malfunctions of control systems or relief equipment, and outside force damage (e.g., by third parties during excavation). Excavation and construction-related damage to pipelines remain the leading causes of pipeline failure. (Transportation Research Board, 2004) High-pressure oil and gas pipelines are located in and near the Planning Area. Chevron operates one active pipeline within the Union Pacific right-of-way. This 8-inch steel high pressure pipeline transports refined petroleum products. PG&E operates natural gas pipelines in parcel APN: 051-170-010 to the north of the Planning Area and adjacent to Viera Avenue.

Emergency Response Plans

The City of Antioch maintains an Emergency Plan addressing response to disasters, including but not limited to earthquakes, floods, fires, hazardous spills or leaks, major industrial accidents, major transportation accidents, major storms, airplane crashes, environmental response, civil unrest, and national security emergencies. The plan outlines the general authority, organization, and response actions for City staff to undertake when disasters happen. The City's plan is in compliance with existing law. The objectives of the plan are to reduce life, injury, and property losses through effective management of emergency forces. Emergency operations centers are maintained at the City's central police facility and at the City water treatment plant. (City of Antioch, 2003)



Hillcrest Station Area Specific Plan

Figure 3.8-2: Existing Pipelines

Source: BKF, 2008; ESA, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.

REGULATORY SETTING

Definitions

Hazardous Material

A hazardous material is defined by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), as a material that poses a significant present or potential hazard to human health and safety or the environment if released because of its quantity, concentration, or physical or chemical characteristics (26 California Code of Regulations 25501).

Hazardous Waste

The DTSC defines hazardous waste as waste substances which can pose a substantial or potential hazard to human health or the environment when improperly managed. Hazardous waste possesses at least one of these four characteristics: ignitability, corrosivity, reactivity or toxicity; or it appears on special EPA lists. Household hazardous wastes include:

- Flammables include paints, dry or wet, petroleum-based products, and polishes.
- Corrosives include acids, bases, batteries, and drain clog remover.
- Toxics include poisons, pesticides, gardening chemicals, ammonia, and solvents.
- Oxidizers include pool chemicals, hydrogen peroxide, iodine, and perchlorates.

Health Hazard

Under OSHA standard 1910.120, a health hazard is defined to mean "a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees."

Federal Regulations

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) enables EPA to administer a regulatory program that extends from the manufacture of hazardous materials to their disposal, thus regulating the generation, transport, treatment, storage, and disposal of hazardous waste at all facilities and sites in the nation.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA 1980), also known as Superfund, was passed to facilitate the cleanup of the nation's toxic waste sites. In 1986, Superfund was amended by the Superfund Amendment and Reauthorization Act Title III (community right-to-know laws). Title III states that past and present owners of land contaminated with hazardous substances can be held liable for the entire cost of the cleanup, even if the material was dumped illegally when the property was under different ownership. Under CERCLA, defense against contamination liability was usually established by conducting Phase I, II and III environmental site assessments (ESA). In 2002, the Small Business Liability Relief and Revitalization Act ("Brownfield Law") was enacted which amends and clarifies liability under CERCLA and provides grant funding for the cleanup of brownfield sites. The law requires that to

have defense against contamination liability one must conduct an "All Appropriate Inquiry" (AAI) prior to property acquisition in accordance with standards established by the EPA.

Title 49 of the Code of Federal Regulations (CFR 49)

Title 49 of the Code of Federal Regulations (CFR 49) contains lists of more than 2,400 hazardous materials and regulates the transport of hazardous materials. The U.S. Department of Transportation (DOT) has developed regulations pertaining to the transport of hazardous materials and hazardous wastes by all modes of transportation. The U.S. Postal Service (USPS) has developed additional regulations for the transport of hazardous materials by mail. US EPA has also promulgated regulations for the transport of hazardous wastes. These more stringent requirements include tracking shipments with manifests to ensure that wastes are delivered to their intended destinations.

Occupational Health and Safety Administration (OSHA)

The Occupational Health and Safety Administration (OSHA) published standard 1910.120, addressing dangers that hazardous materials pose in the workplace. The standard requires that employers evaluate the potential health hazard that hazardous materials pose in the workplace and communicate information concerning hazards and appropriate protective measures to employees.

Pipeline Inspection, Protection, Enforcement and Safety Act of 2006

The Department of Transportation, Pipeline and Hazardous Materials Safety Administration regulates the operation and maintenance of all pipelines.

State Regulations

California regulations are equal to or more stringent than federal regulations. EPA has granted the State of California primary oversight responsibility to administer and enforce hazardous waste management programs. State regulations require planning and management to ensure that hazardous wastes are handled, stored, and disposed of properly to reduce risks to human health and the environment.

Hazardous Materials Release Response Plans and Inventory Act of 1985

The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a plan that describes their facilities, inventories, emergency response plans, and training programs. The law requires businesses that use hazardous materials to provide inventories of those materials to designated emergency response agencies, to illustrate on a diagram where the materials are stored, to prepare an emergency response plan, and to train employees to use the materials safely.

Hazardous Waste Control Act

The Hazardous Waste Control Act created the state hazardous waste management program, which is similar to, but more stringent than, the federal Resource Conservation and Recovery Act program. The act is implemented by regulations contained in Title 26 of the California Code of Regulations, which describes the following required aspects for the proper management of hazardous waste:

- Identification and classification;

- Generation and transport;
- Design and permitting of recycling, treatment, storage, and disposal facilities;
- Treatment standards;
- Operation of facilities and staff training; and
- Closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of them. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from the generator to the transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

California Department of Toxic Substance Control

The California Department of Toxic Substance Control (DTSC), an agency of the California Environmental Protection Agency (CalEPA), regulates hazardous waste in California primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. DTSC is directly responsible for administrating the "Unified Program," which consolidates and coordinates the administrative requirements, permits, inspections, and enforcement activities for environmental and emergency management programs. The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs and is implemented at the local government level by Certified Unified Program Agencies (CUPA).

State requirements assign "cradle-to-grave" responsibility for hazardous waste to hazardous waste generators. Anyone who creates a hazardous waste is considered a hazardous waste generator. Generators must ensure that their waste is disposed of properly, and legal requirements dictate the disposal requirements for many waste streams (e.g., banning many types of hazardous wastes from landfills). All hazardous waste generators must certify that, at a minimum, they make a good faith effort to minimize their waste and select the best waste management method available.

Polychlorinated Biphenyls (PCBs)

DTSC has classified PCBs as a hazardous waste when concentrations exceed 5 parts per million (ppm) in liquids or when a standard extract of a non-liquid exceeds 5 ppm. Electrical transformers and fluorescent light ballasts may contain PCBs, and if so, they are regulated as hazardous waste and must be transported and disposed of as hazardous waste. Ballasts manufactured since 1978, in general, do not contain PCBs and are required to have a label stating that PCBs are not present.

State of California Water Resources Control Board

The State of California Water Resources Control Board (SWRCB) also regulates the handling, storage, and disposal of hazardous substances in construction projects. Permits and/or other action by the SWRCB may be required if contamination of water or soils occurs during the construction of the proposed project.

Emergency Services Act

Under the Emergency Services Act, the state developed an emergency response plan to coordinate emergency services provided by federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important part of the plan, which is administered by the California Office of Emergency Services. The office coordinates the responses of other agencies, including EPA, the California Highway Patrol, regional water quality control boards, air quality management districts, and county disaster response offices.

Other State Laws, Regulations, and Programs

Other agencies and various other state regulations have been enacted that affect hazardous waste management, including:

- The California Highway Patrol, Caltrans, and DTSC play key roles in enforcing hazardous materials transportation requirements.
- Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), which requires labeling of substances known or suspected by the state to cause cancer; and
- California Government Code Section 65962.5, which requires the Office of Permit Assistance to compile a list of possible contaminated sites in the state.
- California Accidental Release Prevention Program Health and Safety Code Section 25531-25543.3; the California Accidental Release Prevention (CalARP) Program is a merging of the federal and state programs for the prevention of accidental release of regulated toxic and flammable substances.

California Division of Occupational Safety and Health

The California Division of Occupational Safety and Health (Cal OSHA) and the federal Occupational Safety and Health Administration are the agencies responsible for assuring worker safety in the workplace. Cal OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices. At sites known to be contaminated, a Site Safety Plan must be prepared and submitted and approved by Cal OSHA to protect workers. The Site Safety Plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site.

Asbestos

Cal OSHA and Bay Area Air Quality Management District (BAAQMD) regulate asbestos as a hazardous air pollutant and as a potential worker safety hazard. Cal OSHA regulations restrict asbestos emissions from demolition and renovation activities, and specify safe work practices to minimize the potential release of asbestos fibers. These regulations prohibit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential to release asbestos fibers; and require notice be given to federal and local government agencies before beginning renovation or demolition that could disturb asbestos. California requires the licensing of contractors who conduct asbestos abatement activities.

Lead

Cal OSHA standards establish a maximum safe exposure level for types of construction work that may result in exposure to lead, including demolition of structures with materials containing lead; removal or encapsulation of materials containing lead; and new construction, alteration, repair, and renovation of structures with materials containing lead. Inspection, testing, and removal of lead-containing building materials are to be performed by state-certified consultants and contractors who are required to comply with applicable health and safety and hazardous materials regulations. Typically, building materials with lead-based paint are not considered hazardous waste unless the paint is chemically or physically removed from the building debris.

Fire Regulations

The "Bates" bill, Government Code Section 51175, was prompted by the devastating Oakland Hills Fire of 1991. This mid-1990s legislation calls for the CAL FIRE Director to evaluate fire hazard severity in local responsibility area and to make a recommendation to the local jurisdiction where very high Fire Hazard Severity Zones exist. The Government Code then provides direction for the local jurisdiction to take appropriate action.

Government Code Sections 51175-51189, California Code of Regulations (CCR), Title 24, and the Public Resources Code Sections 4290 and 4291 contain a variety of requirements related to building construction, defensible space, and fire access in fire hazard severity zones.

California Pipeline Safety Act (CAPSA)

High-pressure pipelines must be operated and maintained in accordance to the regulations within the Pipeline Safety Act. These regulations require a minimum clearance of 12 inches between petroleum pipelines and other crosslines that intersect at a 90 degree angle. If the intersection angle is less than 90 degrees, the minimum clearance must be at least 24 inches. CAPSA Section 51014.6 provides that the pipeline and easement must be maintained clear of obstructions so that aerial observation can be conducted. No person, other than the pipeline operator, is allowed to build a structure, fence, wall or obstruction adjacent to any pipeline easement which would prevent complete and unimpaired surface access to the easement. In addition, no shrubbery or shielding is allowed on the pipeline easement which would impair aerial observation of the pipeline easement. (Transportation Research Board, 2004)

Regional Regulations

California Regional Water Quality Control Board

In coordination with the SWRCB, the Regional Water Quality Control Board (RWQCB) adopts and implements water quality control plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems.

Contra Costa County Health Services

The Contra Costa County Health Services Department, Hazardous Materials Program (CCHSHM), is the local Certified Unified Program Agencies (CUPA). A local CUPA is responsible for administering/overseeing compliance with the following programs, as required by state and federal regulations:

- Hazardous Materials Release Response Plans and Inventories (Business Plans) – The Contra Costa County Hazardous Materials Area Plan was revised in December 2005.
- California Accidental Release Prevention (CalARP) Program
- Underground Storage Tank Program (UST)
- Aboveground Petroleum Storage Act Requirements for Spill Prevention, Control and Countermeasure (SPCC) Plans (AST)
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements

Businesses, such as photographic processing, chrome plating or service stations, which generate small hazardous waste or require underground storage of hazardous materials, require a permit from the Contra Costa County Health Services.

Contra Costa County Industrial Safety Ordinance (ISO)

This County ordinance expands on the California Accidental Release Prevention (CalARP) Program for facilities meeting the following:

- The facility is within an unincorporated area of the County
- The facility is either a petroleum refinery or chemical plant
- The facility is required to submit a Risk Management Plan (RMP) to the U.S. EPA and Contra Costa County Health Service (CCHS)
- The facility has at least one Program 3 process

The Hillcrest Station Planning Area has no facilities which meet any of these criteria.

Delta Diablo Sanitation District

Delta Diablo Sanitation District (DDSD) manages the Delta Household Hazardous Waste Collection Facility, which would be the collection location for East Contra County including the Planning Area.

Contra Costa County Fire Protection District

The Contra Costa County Fire Protection District (CCCFPD) has adopted the 2007 California Fire Code with amendments and the 2007 California Building Code, along with nationally recognized standards such as NFPA.

Local Regulations: Antioch Municipal Code

Section 8-10.01 Adoption of the Uniform Code for the Abatement of Dangerous Buildings

The City of Antioch has adopted the "Uniform Code for the Abatement of Dangerous Buildings, 1997 Edition," published by the International Conference of Building Officials, as adopted and amended by the California Building Standards Commission in the California Building Standards Code; Title 24 of the California Code of Regulations.

Zoning Ordinance Section 9-5.3826 Hazardous Waste Facility

This section of the zoning ordinance defines a hazardous waste facility as a land use type and the requirements that the City has for permitting, criteria, and standards for such facilities.

Antioch General Plan

8.6.2 Solid Waste Management Policies

c. Provide and promote opportunities to reduce solid waste generation at home and in businesses and public facilities, making possible the safe disposal of hazardous materials.

11.7.2 Hazardous Materials Policies

a. Promote the reduction, recycling, and safe disposal of household hazardous wastes through public education and awareness.

b. Implement the provisions of the Contra Costa County Hazardous Waste Management Plan, including, but not limited to, provisions for pretreatment and disposal, storage, handling, and emergency response.

c. Require businesses generating hazardous wastes to pay necessary costs for local implementation of programs specified in the Contra Costa County Hazardous Waste Management Plan, as well as costs associated with emergency response services for a hazardous materials release.

d. Require new and expanding hazardous materials users to reduce the amount of hazardous waste generated.

- Require submittal of a waste minimization plan with any use permit application for a new large facility or expansion of an existing large facility creating additional hazardous wastes.
- Encourage existing large facilities to prepare waste minimization plans.
- Require new large hazardous waste-producing facilities to provide onsite treatment of recycling of wastes generated to the maximum extent feasible. This will minimize the amount of hazardous waste being transferred offsite for treatment or disposal.
- Require all hazardous waste generators to recycle wastes to the maximum extent feasible.

e. Encourage reductions in the amount of hazardous wastes being generated within Antioch through incentives and other methods.

- Provide educational and technical assistance to all hazardous materials users and waste generators to aid in their source reduction efforts (e.g., substitution of less hazardous products and modifications to operating procedures). These services will primarily be provided by through the County.
- Provide public recognition to hazardous materials users and waste generators who meet or exceed source reduction goals.

- Provide penalties for facilities failing to meet minimization objectives, and place funds from these penalties in a revolving account for use in educational and emergency services efforts.

f. Locate hazardous materials facilities in areas reserved for compatible uses.

- Permit large hazardous waste users and processors only in areas designated for "heavy industrial" use. Smaller generators and medical facilities (e.g., service stations) may be sited in other industrial and commercial areas, consistent with applicable General Plan policies and zoning regulations. The compatibility of small facilities will be determined by the types and amounts of hazardous materials involved and the nature of the surrounding area.
- Require use permits for all operations handling hazardous materials to ensure compatibility with the surrounding area.

g. Maintain adequate siting criteria to determine appropriate locations for hazardous material facilities.

- Maintain a "Hazardous Materials" section in the Antioch zoning ordinance to define siting criteria to be used for various types of facilities, requirements for application submittal, and required findings for approval.

h. Locate hazardous materials facilities at a sufficient distance from populated areas to reduce potential health and safety impacts.

- Require risk assessment studies to determine potential health impacts for all proposed hazardous waste processors and large generators as part of permit application submittals.
- Require a 2,000-foot buffer zone around all new hazardous waste processors within which no residences, schools, hospitals, or other immobile populations, existing proposed, or otherwise, would be located, unless evidence is presented in the risk assessment study that a larger buffer is needed.

i. Permit hazardous waste processors based on their relative need in conjunction with the "fair share" approach to facilities siting contained in the Contra Costa County Hazardous Waste Management Plan.

- Require a needs assessment as part of use permit applications for a waste processor, demonstrating the proposed facility will serve a need that cannot be better met in any other manner (e.g., source reduction) or at any other location.
- Discourage proposed hazardous waste facilities processing materials similar to those treated or stored at existing facilities within the County, unless the need for the new facility can be adequately demonstrated.

j. Carefully review and require appropriate mitigation for pipelines and other channels for hazardous materials.

k. Ensure adequate provision is made for emergency response to all crises involving hazardous materials.

- Require emergency response plans for all hazardous waste processors and large generators to be submitted as part of use permit applications.

- Require training of employees of all facilities in emergency procedures, and that they be acquainted with the properties and health effects of the hazardous materials involved in the facilities' operations.

l. Promote the safest possible transport of hazardous materials through Antioch.

- Maintain formally designated hazardous material carrier routes to direct hazardous materials away from populated and other sensitive areas.
- Restrict all processors and new large generators to access only along established hazardous material carrier routes.
- Locate hazardous waste processors as near to waste generators as possible, in order to minimize the need for transport.
- Require transportation analyses for all new large generators and processors to determine the effect of each facility on Antioch's transportation system, and assess and provide mitigation for potential safety impacts associated with hazardous materials transported to and from the site.
- Prohibit the parking of vehicles transporting hazardous materials on City streets.
- Require that new pipelines and other channels carrying hazardous materials avoid residential areas and other immobile populations to the greatest extent possible.

m. Require that hazardous materials facilities within Antioch operate in a safe manner.

- As a condition of approval for new hazardous materials facilities, require access for vehicles carrying hazardous materials to be restricted to hazardous materials carrier routes.
- Undertake inspections of hazardous materials facilities as needed (e.g., when an unauthorized discharge into City sewers is made), and assist Contra Costa Health Services in their inspections as requested.
- Require that water, sewer, and emergency services be available consistent with the level of service standards set forth in the Growth Management Element. Work with LAFCO to require that that sites for proposed hazardous materials facilities annex into the City before necessary municipal services are provided.

n. Require appropriate design features be incorporated into each facility's layout to increase safety and minimize potential adverse effects on public health.

- Require the provision of spill containment facilities and monitoring devices in all facilities.
- Ensure that pipelines and other hazardous waste channels are properly designed to minimize leakage and require above ground pipelines to be surrounded by spill containment basins.
- Give priority to underground storage of hazardous materials, unless this method is shown to be infeasible.
- Require hazardous materials storage areas to be located as far from existing pipelines and electrical transmission lines as possible.

o. Maintain a high priority on clean-up of the GBF landfill, Hickmott Cannery, and other contaminated sites.

- Maintain communication with the Department of Toxic Substances Control, Contra Costa Health Services, and other responsible agencies to complete clean-up of the GBF landfill and Hickmott Cannery sites as rapidly and thoroughly as possible.
- Participate in task forces with County and State agencies for remediation of the GBF landfill and Hickmott Cannery sites.

p. Require that new large hazardous materials users and/or processors maintain communication lines within the Communication and Information Panel. Encourage existing large users and processors to form similar panels.

q. Facilitate public awareness of hazardous materials by preparing and distributing in conjunction with Contra Costa Health Services public information regarding uniform symbols used to identify hazardous wastes, Antioch's household hazardous waste collection programs, and hazardous waste source reduction programs.

r. Monitor the progress and success of hazardous materials efforts, and modify these efforts as needed.

s. Maintain data regarding the use and generation of hazardous materials within Antioch and its Planning Area.

8.10.2 Fire Protection Policies

a. Work with the Contra Costa County Fire Protection District to provide high quality fire protection services to area residents and businesses. The City's role should include, but not be limited to:

- Determining the appropriateness of station location sites;
- Enforcement of building codes to reduce fire hazards;
- Collection of mitigation fees established by the fire district to construct needed additional stations within the Antioch Planning Area.
- Support the District in providing funding for personnel costs to staff stations within the City;
- Support the District in establishing fees that are adequate to mitigate the impacts of new development and income to support operation of new stations whose construction is financed with development fees; and
- Requiring reasonable reservation of appropriate sites for new fire stations as part of new development.

b. In cooperation with the Contra Costa County Fire Protection District, conduct an annual assessment of the adequacy of facilities and services serving Antioch, personnel and staffing needs, and capital needs, based on anticipated growth and the level of service standard set forth in the Growth Management Element. This assessment should be undertaken as part of the annual

review of proposed capital projects required by the California Government code (see Chapter 12, Implementation, Section 12.4b).

c. Provide the Contra Costa County Fire Protection District with timely information on development proposals and projected levels of future growth so that it can maintain appropriate long-term master plans and refine the delivery of service and facilities to maintain the performance standards set forth in the Growth Management Element.

d. Involve the Fire Protection District in the development review process by referring development requests to the Fire District for review and comment.

11.8.2 Disaster Response Policies

a. Maintain and update the City's emergency Response Plan, as required by State law.

b. Disseminate disaster preparedness information to local residents and businesses, describing how emergency response will be coordinated, how evacuation, if needed, will proceed, and what residents and businesses can do to prepare for emergency situations. Provide information to the public about:

- Environmental hazards existing in Antioch;
- The costs of doing nothing to mitigate these hazards;
- Why governmental agencies can not eliminate all hazards;
- What the City does to assist;
- What the City cannot do;
- What the public can do to protect itself.

c. Maintain an effective and properly equipped emergency operations center, along with trained personnel, for receiving emergency calls, providing initial response and key support to major incidents, meeting the demands of automatic and mutual aid programs, and maintaining emergency incident statistical data.

d. Maintain ongoing emergency response coordination with surrounding jurisdictions.

e. Encourage private businesses and industrial uses to be self-sufficient in an emergency by:

- Maintaining a fire control plan, including onsite fire fighting capability and volunteer response teams to respond to and extinguish small fires; and
- Identifying personnel who are capable and certified in first aid and CPR.

f. Regularly review and clarify emergency evacuation plans for dam failure, fire, and hazardous materials releases.

Performance Standard

3.5.2.2 Prior to approval of discretionary development projects, require written verification from the Contra Costa County Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact if the Plan would:

Hazardous Materials

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school; or
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.

Fire Hazards

- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

METHODOLOGY AND ASSUMPTIONS

Hazardous Materials Environmental Database Review

An electronic file search and review of existing Environmental Site Assessment reports was used to identify any reported hazardous materials spills and releases within the Planning Area. Environmental databases reviewed include EnviroStor, Cal-Sites, GeoTracker, and Cortese databases.

The EnviroStor database, maintained by the DTSC, provides information for properties regulated by DTSC's Site Mitigation and Brownfields Reuse Program where extensive investigation and/or cleanup actions are planned or have been completed. The Cal-Sites database, also maintained by DTSC, contains information regarding both known and potential hazardous substance sites. The GeoTracker database, maintained by the SWRCB, provides regulatory data regarding sites with leaking underground fuel tanks, fuel pipelines, and public drinking water supplies. The Cortese

database, maintained by the Cal EPA, identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release, and all solid waste disposal facilities from which there is known migration. It is not uncommon for sites with reported hazardous material spills and/or releases to be listed on more than one database.

Engeo Incorporated performed a Phase One Environmental Sites Assessment of the County Crossing properties in general conformance with the scope and limitations of ASTM E 1527-05 "Standard Practice for Environmental Sites Assessments" and US EPA "Standards and Practice for All Appropriate Inquiries," 40 CFR Part 312. The Phase One ESA contains records reviews and site reconnaissance data for 268 acres within the Planning Area. The records review included a survey of available preliminary title reports as well as historical records sources. The Phase One ESA includes materials from the environmental databases listed above plus a review of permits from the City of Antioch Building and Planning Departments and Contra Costa County Health Services. The Phase One ESA did not include an asbestos or lead-based paint survey.

Urban/Wildland Fire Interface

The California Department of Forestry and Fire Protection (CDF) is directed by State law to map zones of significant fire hazards, referred to as Fire Hazard Severity Zones (FHSZ). CAL FIRE's Fire and Resource Assessment Program (FRAP) creates the maps using data and models describing development patterns, potential fuels over a 30-50 year time horizon, expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure to new construction. The FHSZ define the application of various mitigation strategies to reduce risk associated with wildland fires. The FRAP maps are currently being updated. The September 2007 draft map was reviewed for this analysis.

SUMMARY OF IMPACTS

Hazardous Materials and Waste

Soil and groundwater remediation is on-going on various properties within the Planning Area and the concentrations of contaminants in certain areas are above regulatory thresholds. Disturbance of previously contaminated areas through grading or excavation operations and the demolition of structures built with hazardous materials could expose the public to health hazards from physical contact with hazardous materials including potential airborne or waterborne hazards. Full compliance with existing regulations and proposed Specific Plan policies would ensure that impacts of hazardous materials are less than significant.

Increases in hazardous material use or generation of hazardous waste associated with industrial or commercial use, as well as household hazardous material use, would likely occur with residential and job growth within the Planning Area. However, future land uses will be subject to hazardous materials use, transport, and disposal regulations, and therefore, impacts would be less than significant.

There are no existing or proposed schools within one-quarter mile of the Planning Area, therefore the potential hazardous materials impacts on schools is not evaluated.

The City of Antioch requires that large hazardous waste users and processors, which could contribute to significant accidental hazardous materials release conditions, be sited in Heavy Industrial land use districts. In addition, new hazardous waste processors cannot be sited within 2,000 feet of sensitive receptors including residential uses. Therefore, no new large hazardous waste users and processors are anticipated within the Planning Area and the impact of accidental hazardous materials release conditions is not evaluated.

High-Pressure Pipelines

Development in the Planning Area will occur in the vicinity of high-pressure pipelines. Proposed Specific Plan policies would ensure that impacts from pipelines incidents are less than significant.

Urban/Wildland Fire Hazards

With development of the Specific Plan Area the fire risk is expected to remain at a moderate level, however, compliance with General Plan policies and proposed Specific Plan policies related to the fire protection and the establishment of a new fire station in or near the Planning Area would ensure that fire hazard impacts are less than significant.

Emergency Response

There is no indication that the proposed Specific Plan or pursuant development would interfere with the implementation of the Antioch Emergency Plan. Improving access in and around the Planning Area would allow adequate emergency response capabilities to serve new development, and have an overall benefit for emergency response by providing new circulation routes..

IMPACTS AND MITIGATIONS

3.8-1 ***Implementation of the Hillcrest Station Area Specific Plan could expose construction workers and/or the public to soil and groundwater impacted with petroleum-products, agriculture chemicals, or other hazardous materials. (Less than Significant)***

Soil and groundwater remediation is on-going on various properties within the Planning Area and the concentrations of contaminants in certain areas are above regulatory thresholds. The following properties, shown on Figure 3.8-1, have been specifically identified as having hazardous materials:

- Former Hickson-Kerley (FKP) Property (APN: 052-051-034);
- Chevron Old Valley Pipeline;
- TAOC New Love Pump Station Site (APN: 052-051-034); and,
- PG&E Oakley Metering Station (APN: 052-051-035)

Other parcels have not been fully evaluated for potential soil and groundwater contamination at this time. These conditions could expose individuals to hazardous health conditions at or near the contaminated sites. Disturbance of contaminated soils during grading or excavation could expose construction workers and the public to the hazardous materials or hazardous vapors. Although various local, State, and federal regulations govern the proper storage, handling and transport of hazardous materials, the improper handling or storage of contaminated soil and groundwater can

further expose the public to these hazards, or potentially spread contamination through surface water runoff or air borne dust. In addition, contaminated groundwater can spread down gradient, potentially contaminating subsurface areas of surrounding properties.

If buildings are erected over contaminated materials, volatile contaminants could potentially migrate from soil and groundwater via soil gases, and enter indoor air spaces through foundation cracks, posing a potential health risk to future site workers, employees, and residents.

Furthermore, existing structures that would be demolished in the Planning Area could potentially include hazardous building materials such as asbestos, PCBs, or lead-based paint. If not properly removed and handled, these materials could pose a significant threat to human health and the environment.

Project-related impacts to human health and the environment associated with site contamination and hazardous building materials would be considered potentially significant. However, implementation of the policies included in the Antioch General Plan and the proposed project reduce the potential impacts of hazardous materials to a less than significant level for the proposed Specific Plan.

Specific Plan Policies that Reduce Impact

In addition to compliance with existing General Plan policies, implementation of the following proposed Specific Plan policies would reduce the impact of contaminated soils and groundwater to less than significant:

All Parcels

EH-37 Prior to approval of any discretionary permits for subdivisions or new construction, property owners shall work with the Contra Costa County Fire Protection District (CCCFPD), the Contra Costa County Health Services Department (CCCHSD), the California Department of Toxic Substances Control (DTSC), and/or the California Regional Water Quality Control Board (RWQCB), whichever has jurisdiction, to resolve issues related to contamination that could potentially impact future land uses in the project area.

Parcels with Known Contamination

EH-38 For parcels with known contamination, the lateral and vertical extent of contamination shall be determined; cleanup activities shall be undertaken per state and federal regulations; and appropriate land use restrictions implemented, as necessary, prior to the issuance of development permits on parcels with known contamination.

EH-39 As part of the project entitlement process, appropriate studies shall be conducted for each site with an open remediation case based on proposed land uses by a qualified environmental professional. The studies shall compare maximum soil, soil gas, and groundwater concentrations to relevant environmental screening levels (ESLs) and evaluate all potential exposure pathways from contaminated groundwater and soil. As required by the appropriate responsible agency, studies shall be prepared for the:

- Former Hickson-Kerley (FKP) Property (APN: 052-051-034);
- Chevron Old Valley Pipeline;

- TAOC New Love Pump Station Site (APN: 052-051-034); and,
- PG&E Oakley Metering Station (APN: 052-051-035)

EH-40 At sites with known contamination issues, a Construction Risk Management Plan (RMP) shall be prepared and approved prior to commencement of construction, to protect the health and safety of construction workers and site users adjacent to construction activities.

Parcels with Potential Contamination

EH-41 Soil and water contamination assessments are required to ensure public health for projects on the following properties:

- PDQ parcel (APN: 052-052-002);
- Former orchards;
- Parcels adjacent to the PG&E Substation property;
- Parcels adjacent to the railroad right-of-way;
- Parcels adjacent to active and inactive petroleum pipelines;
- Park-n-ride lot (APNs: 052-011-009, 052-011-010, 052-011-011, 052-011-015, 052-011-016); and,
- Detention basins (APN: 051-170-004, 051-170-053, 051-333-001, 052-030-022).

EH-42 If soil or groundwater contamination is identified on any parcel in the Hillcrest Station Area, the lateral and vertical extent of contamination shall be determined; cleanup activities shall be undertaken per state and federal regulations; and appropriate land use restrictions implemented, as necessary, prior to issuance of development permits.

EH-43 The City of Antioch and property owners shall contact and work with Union Pacific to ensure that planned railway improvements that disturb potentially contaminated soils do not impact nearby properties or development, or cause a public health hazard.

EH-44 Project applicants shall submit to the City a project Demolition Plan that addresses onsite and offsite chemical and physical hazards. The Demolition Plan shall contain:

- Information, to be verified by the City prior to the issuance of demolition permits for any existing structures or buildings, regarding the presence of hazardous building materials such as asbestos-containing building materials, PCBs, and lead-based paint in existing buildings proposed for demolition, additions, or alterations;
- Protocols for ensuring the safety of workers and the public during demolition or construction activities, as approved by the City. These protocols will include, but are not limited to:
  - Prior to demolition, hazardous building materials shall be removed and appropriately disposed of in accordance with all applicable guidelines, laws, and ordinances.
  - The demolition of buildings containing asbestos requires that licensed asbestos abatement contractors are retained and the Bay Area Air Quality Management

District (BAAQMD) is notified ten days prior to initiating construction and demolition activities.

- The Cal-OSHA-specified method of compliance for demolition activities involving lead-based paint including required respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, and training shall be required.
- Any electrical transformers and fluorescent light ballasts that do not have labels stating that they do not contain PCBs, shall be treated as hazardous waste and are subject to all hazardous waste regulations.

UD-20 Provide a continuous landscape buffer along both sides of the rail line corridor, outside of the Union Pacific and Chevron easements. The minimum width of the landscaped buffer shall be 25 feet if adjacent to a building; and 15 feet if adjacent to a street.

- Include landscaping, berming (typically 4 to 5 feet high), and at least one continuous row of trees throughout the area.
- This landscape buffer may be located within the Chevron easement if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project.

UD-22 Provide a continuous landscape buffer, with a minimum width of approximately 25 feet, around the southern and eastern edges of the Hillcrest PG&E Substation.

- Include landscaping and a continuous double row of trees to screen the facility from new development, SR 4, and the eBART station.
- Work with PG&E when the company decides to expand substation operations within their site, to ensure an adequate separation is retained between the substation and development.

Mitigation Measures

Compliance with the General Plan and proposed Specific Plan policies will ensure that no further mitigation measures are required to reduce the potential impact of hazardous materials to less than significant levels.

3.8-2 *Future land uses proposed by the Hillcrest Station Area Specific Plan could involve the transport, use, and disposal of hazardous materials. (Less than Significant)*

Future commercial, residential, and light industrial land uses under the proposed project would likely involve the use, transport, and disposal of hazardous substances including paints, polishes, petroleum-based products, household cleaning agents, solvents, gardening chemicals, pool chemicals, and ammonia. Above-ground storage tanks and underground-storage tanks could also be used.

Hazardous materials transportation, use, and disposal are subject to state and federal hazardous materials laws and regulations. Hazardous materials would be required to be transported under DOT regulations. The proposed project would be subject to hazardous materials programs and ordinances administered by the Contra Costa County Fire Protection District, the Contra Costa

County Health Services Department, and the Antioch General Plan. Businesses associated with aboveground and underground storage tanks and the generation of hazardous waste must be permitted and inspected annually by the Contra Costa Health Services Hazardous Materials Programs (CCHSHM).

Due to mandatory compliance with federal, state, and local regulations, potential impacts associated with future hazardous material use, transport, and disposal are considered less than significant for the proposed Plan.

Mitigation Measures

No mitigation measures are required.

3.8-3 ***Implementation of the proposed Specific Plan would expose people or structures to some risk of loss, injury, or death involving high-pressure pipeline incidents. (Less than Significant)***

While there is a general recognition that pipelines pose a hazard to people, property, and the environment, the extent of the danger is not well understood. Risk is inherent in the pipeline system—it can be reduced and managed, but it cannot be eliminated. Pipeline operators are required to comprehensively assess, identify, and address the safety of pipeline segments that are located in areas where the consequences of a pipeline failure could be significant. However, these requirements may be insufficient to protect life, property, and the environment from the effects of a pipeline incident.

The City of Antioch does not regulate activities and development near high-pressure pipelines. Land use measures can reduce the risk of disturbing the pipelines by keeping human activity away from the immediate vicinity of the pipelines and by minimizing the exposure of those living and working near a transmission pipeline in the event of an incident. Transmission pipelines generally are not subject to any local land use regulation. In most instances, the width, configuration, and control of pipeline rights-of-way are established without local input. Provisions with regard to the widths of rights-of-way are often established for laying and inspecting the pipeline rather than for public safety or prevention of environmental damage. For example, a catastrophic failure of a high-pressure natural gas transmission pipeline could cause injury to people 100 feet or more away.

Specific Plan Policies that Reduce Impact

Implementation of the following proposed Plan policies will help to reduce the impact of high-pressure pipeline incidents in the Planning Area:

EH-54 Prior to the approval of development permits, require a disposition plan for all petroleum pipelines so that required mitigations (relocation, abandonment or protection) can be determined.

EH-55 The City of Antioch and property owners shall work with Chevron to evaluate the risk factors related to the active high-pressure petroleum product pipelines, including product transported, operating pressure, age of pipeline, and depth of cover, and to provide adequate access to the oil pipelines in the Hillcrest Station Area. If it is

determined that there is a significant risk to adjacent residential development, prepare a Risk Management Plan or comparable risk reduction action plan.

UT-15 Develop a comprehensive map showing all existing service corridor and utility easements to ensure proper inter-agency coordination prior to issuing any grading permits. Maps should show the location and dimensions of each pipeline within the easement or right-of-way. Coordinate with:

- Chevron to map all active and abandoned petroleum product pipelines;
- PG&E to map all active natural gas pipelines;
- City of Antioch Public Works Department to map all stormwater pipelines;
- Delta Diablo Sanitation District to map all sewer pipelines; and,
- Contra Costa Water District to map all water pipelines.

UD-20 Provide a continuous landscape buffer along both sides of the rail line corridor, outside of the Union Pacific and Chevron easements. The minimum width of the landscaped buffer shall be 25 feet if adjacent to a building; and 15 feet if adjacent to a street.

- Include landscaping, berming (typically 4 to 5 feet high), and at least one continuous row of trees throughout the area.
- This landscape buffer may be located within the Chevron easement if permission, encroachment permits, and maintenance agreements are obtained prior to final approval for a development project.

LU-23 Locate residential units away from railroads and freeways, to minimize impacts from noise and air emissions. Units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts.

Mitigation Measures

No mitigation measures are required.

3.8-4 ***Implementation of the proposed Specific Plan would expose people or structures to some risk of loss, injury or death involving urban or wildland fires. (Less than Significant)***

The Planning Area has a moderate wildland fire threat based on existing conditions. Implementation of the proposed Specific Plan will allow the area to be almost completely urbanized. However, urban areas are also considered to have moderate levels of fire threat, primarily due to decorative vegetation. One of the primary factors contributing to the effective control of a vegetation fire is the rapid response by local fire units. In addition, all new construction must meet standards in the Uniform Fire Code.

The proposed Plan anticipates that the area with moderate level of fire hazard will be graded and developed, likely reducing the level of fire hazard. However, due to the anticipated urban nature of development, the fire threat will generally remain moderate. The Specific Plan policies support the construction of a new fire station in or near the Planning Area. Therefore, these are less than significant impacts due to wildland fires.

Specific Plan Policies that Reduce Impact

UT-20 At the time of any development application, subdivision, or master plan submittal, inform the CCC Fire Protection District, and involve them in the development review process. Prior to approval of any discretionary development project in the area, require written verification from the CCC Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis.

UT-21 Project sponsors are required to submit a minimum of three (3) copies of a site plan for each phase of development so that Contra Costa County Fire Protection District is able to determine the placement of fire hydrants, required fire flow, and review of access in order to ensure compliance with minimum requirements as set forth in the California Fire Code.

UT-22 The City and project sponsors in the Planning Area shall work with the Contra Costa County Fire Protection District to provide a 1-acre building site at a location subject to approval by the Contra Costa County Fire Protection District.

UT-23 Fire access roadways and fire hydrants shall be installed and in service prior to construction.

UT-24 Traffic signals, which are installed or modified as part of this Specific Plan, shall have preemption devices (Opticom) installed.

Mitigation Measures

No mitigation measures are required.

3.9 Hydrology and Water Quality

This section provides a description of the existing storm water drainage conditions, groundwater occurrence, water quality, and flooding issues within, adjacent to, and downstream of the Hillcrest Station Area Specific Plan Planning Area (referred to throughout this section as "Planning Area"). Relevant regulatory information is provided, and potential impacts related to water quality, floodplain development, drainage, and groundwater are identified. Additional analysis of the storm drainage system is discussed in Section 3.13 Utilities.

ENVIRONMENTAL SETTING

SURFACE WATER HYDROLOGY

Climate and Topography

The climate of East Contra Costa County is characterized as Mediterranean with warm, dry summers and mild, wet winters. The region's rainy season extends from October to April, with relatively dry conditions for the remainder of the year. Average annual rainfall in the vicinity of the Planning Area is 14 inches. Temperatures are generally moderate with a comparatively small range of temperatures between the winter low and summer high. Average temperatures range from 37 degrees Fahrenheit in winter months to 91 degrees Fahrenheit in summer months (Western Regional Climate Center, 2008).

The Planning Area is located on the northern flank of Mount Diablo at the southern edge of the Pittsburg-Antioch Plain. The Pittsburg-Antioch Plain is an alluvial plain that slopes gently north away from the base of the foothills of Mount Diablo to the tidal marshes of the Sacramento-San Joaquin Delta. With the exception of two hills adjacent to SR 4, the Planning Area is a shallow valley bisected by East Antioch Creek, which meanders in a northwest direction across the site. The topography of the Planning Area varies from gentle slopes of 2-3 percent on the valley floor to 15-30 percent slopes on the hilly areas in the southeast. Ground elevations range from approximately 20 feet above mean sea level (msl) at the western boundary, to approximately 200 feet above msl in the southeast (see Figure 3.7-1 Topography in Section 3.7 Geological and Seismic Hazards).

East Antioch Creek Watershed

The Planning Area is located in the East Antioch Creek Watershed. The East Antioch Creek Watershed drains approximately 11.4 square miles from its low elevation headwaters in the northernmost foothills of Mount Diablo near the city boundaries of Antioch and Brentwood to the Sacramento-San Joaquin River Delta. The East Antioch Creek Watershed is shown in Figure 3.9-1. The watershed contains only one primary tributary – East Antioch Creek, which flows in a generally northwest direction, eventually emptying into the San Joaquin River 1.5 miles northwest of the Planning Area. With the exception of a 1-mile reach south of SR 4, most of the creek is an aboveground earthen channel. Several detention basins and levees have been built along the creek to promote infiltration and contain storm flows. Lake Alhambra, located about 0.5 miles northwest of the Planning Area, serves recreational purposes while also absorbing flood flows from storm events, and improving the water quality of East Antioch Creek by allowing for sediments and contaminants from urban runoff to settle prior to discharging into the Delta.

Restoration projects in the lower watershed are underway just upstream of Alhambra Lake and in the tidal marsh areas close to the Delta (Jones and Stokes, 2004).

Site Drainage

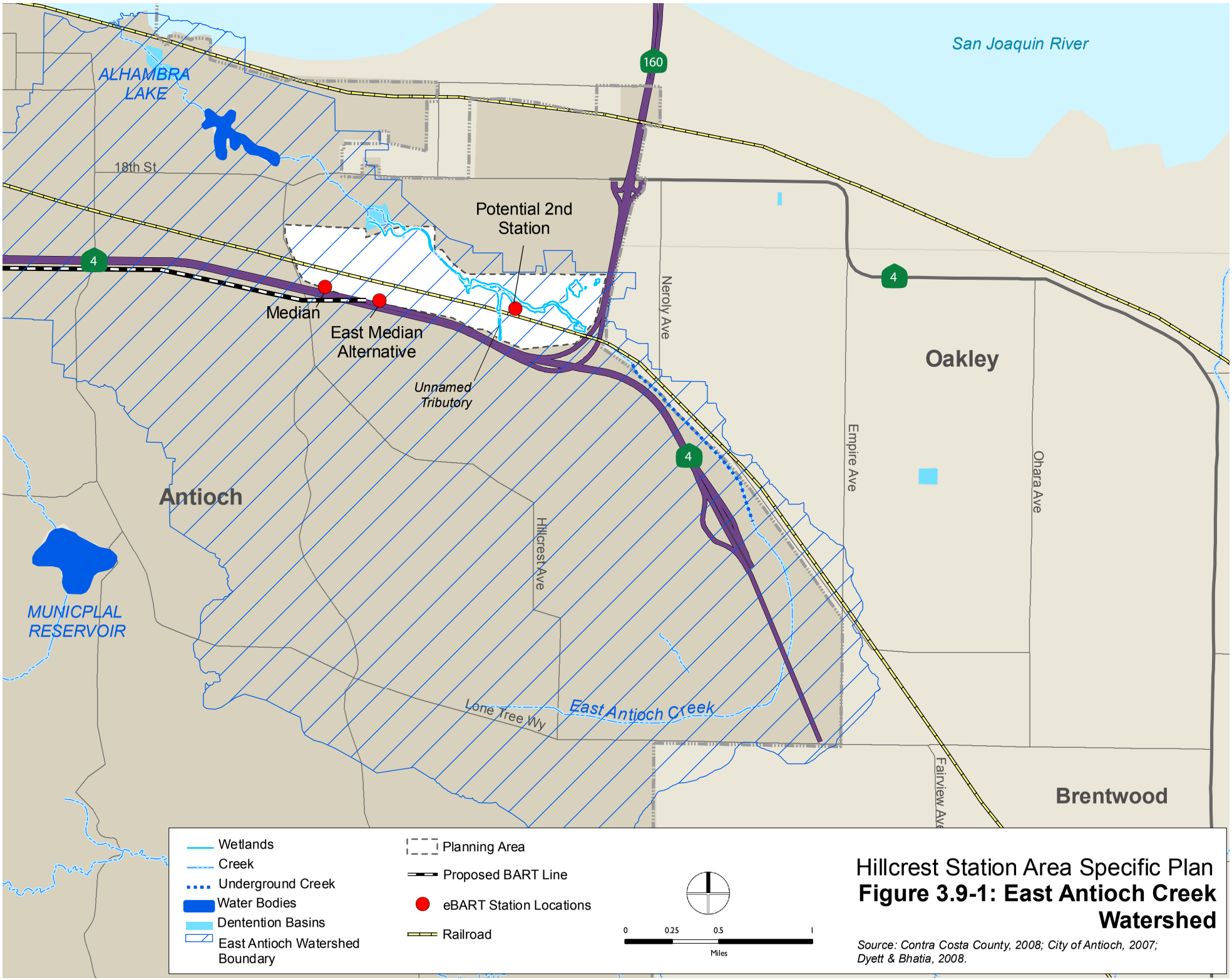
The hydrology of East Antioch Creek has been modified to accommodate development and for flood control. In the vicinity of the Planning Area, East Antioch Creek is perennial and is supported by precipitation runoff and groundwater during wet months, but also receives major dry-season inputs from both natural and artificial sources (e.g., upwelling springs, surface or subsurface flows from local irrigation, respectively). Other surface hydrological features within the Planning Area include: an unnamed tributary that originates south of SR 4 and flows north under the Southern Pacific Railroad crossing to its confluence with East Antioch Creek; a drainage swale and seasonal wetland complex in the northeast corner of the Planning Area that captures runoff from SR 160, Oakley Road, and adjacent residences; and two Contra Costa County Flood Control and Water Conservation District (CCCFCWCD) basins that help to promote infiltration and detain storm flows – the Oakley and Trembath Detention Basins. Two seasonal ponds exist within the Planning Area. The larger 0.26-acre pond is within the East Antioch Creek channel just east of Willow Ave; the smaller 0.03-acre pond is within the unnamed tributary just south of the Southern Pacific Railroad Crossing. Storm water from the Planning Area and surrounding areas originates as overland sheet flow and is either captured in the detention basins, ponds, or wetlands, or is conveyed downstream by East Antioch Creek.

Flooding

100-Year Floodplain

Flooding is inundation of normally dry land as a result of rise in the level of surface waters or rapid accumulation of storm water runoff. Regional flooding hazards, as evaluated by the Federal Emergency Management Agency (FEMA), are presented in community Flood Insurance Rate Maps (FIRMs) as part of the flood hazard mapping program. Official FEMA FIRMs encompassing the Planning Area are presented in Figure 3.9-2. (FEMA, 1987a, b) The FIRMS indicate portions of the Planning Area are subject to inundation during 100-year flood event (i.e. storm with a likelihood of occurring every 100 years), as follows:

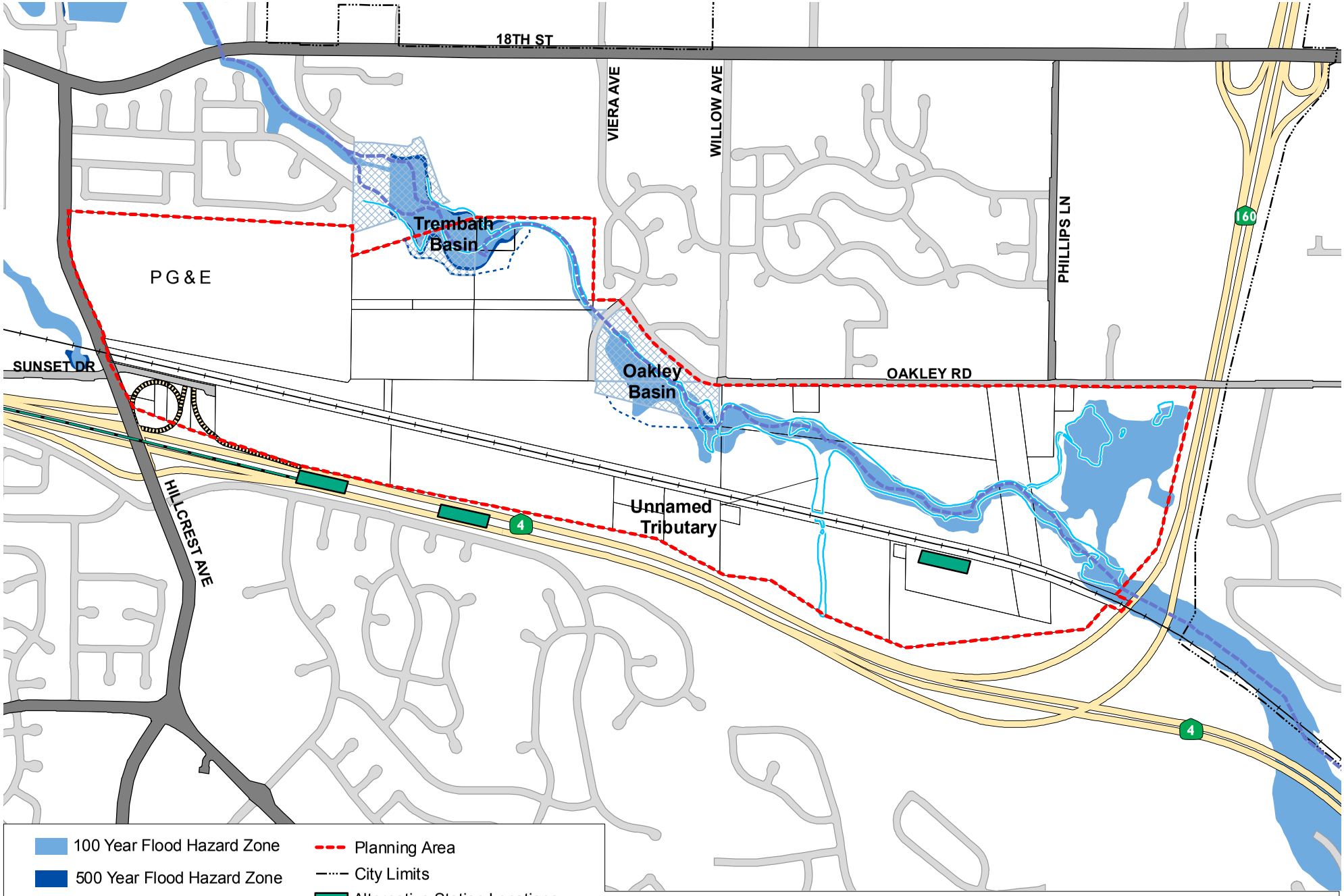
- *East Antioch Creek Channel* - A 200- to 300-foot-wide band along East Antioch Creek between SR 4 and Willow Avenue is mapped as being within the 100-year flood hazard zone. East of Willow Avenue, a 100- to 150-foot-wide band along the creek west of Willow Avenue, is mapped as a floodway area in the 100-year flood hazard zone.
- *Wetland Complex* - The footprint of the wetland complex located at the northeast corner of the Planning Area is mapped as being within the 100-year flood hazard zone with flood depths of 1 to 3 feet.
- *Oakley and Trembath Detention Basins* – The footprints of the detention are within the 100-year flood hazard zone.



Hillcrest Station Area Specific Plan

Figure 3.9-1: East Antioch Creek Watershed

Source: Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.



Hillcrest Station Area Specific Plan

Figure 3.9-2: Flood Hazard Zones

Source: ESA, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.

A FEMA Letter of Map Revision (LOMR) dated April 30, 2007 revised the flood hazard designation for the reach of the creek located southeast of State Route 4 (SR 4) but did not affect FEMA flood zone designations or elevations on the Planning Area (FEMA, 2007).

Data from FEMA also shows the 500-year flood hazard zone. All the areas within the 500-year zone are within detention basins, and therefore there is no potential for development within the 500-year flood hazard zone.

Tsunamis, Seiches, and Dam Inundation

Flooding can also occur due to tsunamis, seiches, or failure of dams. Tsunamis are waves caused by an underwater earthquake, landslide, or volcanic eruption. Low-lying portions of the City of Antioch adjacent to the San Joaquin River could be affected by a tsunami. However, projected wave height and tsunami run-up is expected to be small in the interior portions of the San Francisco Bay and the Delta (City of Antioch, 2003). A seiche is a rhythmic motion of water in a partially or completely landlocked water body caused by landslides, earthquake-induced ground accelerations, or ground offset. As the Planning Area is not located in close proximity to a closed body of water such as a lake or reservoir (Oakley and Trembath Detention Basins are located along East Antioch Creek and are therefore not closed bodies of water), there is no risk of flooding from seiche. The Planning Area is located approximately 1.5 mile downstream of Antioch Reservoir and two miles downstream of Contra Loma Reservoir. According to dam failure inundation maps prepared by the Association of Bay Area Governments (ABAG), the Planning Area is not located within a dam failure inundation zone (ABAG, 2007).

Drainage and Flood Control

Drainage facilities in the Planning Area are under the jurisdiction of the City of Antioch and CCCFCWCD. The CCCFCWCD is responsible for Drainage Area 56 which includes the Oakley and Trembath Detention Basins, as well as the Lindsey Detention Basin located southeast of the Planning Area along East Antioch Creek. Generally, the CCCFCWCD purchases the land needed for detention basins, makes the improvements, and then works with the City to operate and manage the basins. The City of Antioch maintains catch basins, storm channels, creeks, culverts, and concrete lined “V” ditches in open space that handle storm water runoff within the its jurisdiction. Drainage infrastructure is financed through a variable drainage area flood control improvement fee on new development.

The Oakley and proposed Trembath Detention Basins provide flood protection for the portions of the City of Antioch within the East Antioch Creek Watershed, including the Planning Area. Since 1982, the CCCFCWCD has planned to expand Oakley Basin and construct Trembath Basin to accommodate increased storm flows from new development, increase flood storage, and control downstream flooding. In 1986, the first phase of the expansion project was completed. Since then, CCCFCWCD has secured the funding necessary for the next phase through Drainage Area 56 development fees. The next phase of expansion improvements is scheduled for 2010-2011 (Standafer, 2008). CCCFCWCD plans to acquire adequate temporary or permanent rights-of-way to accommodate elevated floodwaters during the final design process.

The Oakley Basin was built to serve development in the City of Oakley and has a storage capacity of 50 acre-feet. The City of Antioch owns a portion of the existing basin. The CCCFCWCD has plans to expand the basin to approximately 70 acre-feet storage capacity, which would place the dam at the Oakley Basin under the jurisdiction of the California Department of Water Resources

Division of Safety of Dams (DSOD)[1]. The dam at Oakley Basin would be retrofitted to meet current state standards.

The storage capacity of the Trembath Basin is designed for 100 acre-feet. The district plans to use the dirt excavated from the Oakley Basin to build a dam as the western edge of the Trembath Basin. The 14-foot high embankment dam would better control flow released to Lake Alhambra. With the improvements in place, the two basins will have a combined storage capacity to accommodate the 100-year flood event. Funding for these drainage improvements has been secured; however, a schedule for implementation has not been determined.

SURFACE WATER QUALITY

Beneficial Uses

The San Francisco Bay Regional Water Quality Control Board (RWQCB) is responsible for developing and enforcing surface water and groundwater quality objectives in the Planning Area. The SF Bay RWQCB is also responsible for preparation and implementation of the San Francisco Bay Water Quality Control Plan (Basin Plan). The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the San Francisco Bay region. The Basin Plan identifies beneficial uses of surface waters and groundwater within its region, and specifies water quality objectives to maintain the continued beneficial uses of these waters.

Although the beneficial uses of East Antioch Creek have not been specified, under the "tributary rule," which provides that water quality standards for specific waterbodies apply upstream to tributaries for which no site-specific standards have been adopted, the beneficial uses of the Sacramento-San Joaquin River Delta, located approximately 1.5 miles northwest of the Planning Area, can be applied to East Antioch Creek.

According to the Basin Plan, the Delta is designated for the following beneficial uses: agricultural supply; municipal and domestic supply; groundwater recharge; industrial service and process supply; ocean, commercial and sport fishing; estuarine habitat; fish migration; preservation of rare and endangered species; fish spawning; wildlife habitat; water contact recreation; non-contact recreation; and navigation (SF Bay RWQCB, 2006).

Impaired Water Bodies

Section 303(d) of the Clean Water Act (CWA) requires that the RWQCBs identify waterbodies that do not meet water quality standards and are not supporting their beneficial uses. The affected water bodies, and associated pollutants or stressors, are prioritized on the 303(d) List of Impaired Water Bodies. In addition to identifying the water bodies that are not supporting beneficial uses, the Section 303(d) List also identifies the pollutant or stressor causing impairment, and establishes a schedule for developing a control plan to address the impairment.

East Antioch Creek is not listed on the Section 303(d) List. However, the Sacramento-San Joaquin

[1] Dams under the DSOD jurisdiction are periodically reviewed by DSOD to evaluate the stability of the dams and their major appurtenances. The DSOD may impose reservoir storage restrictions if it is determined that a dam is unsafe or does not meet current state standards

River Delta, the receiving water body to East Antioch Creek, is listed as impaired due to chlordane, DDT (dichlorodiphenyl trichloroethane), dieldrin, dioxin compounds, exotic species, furan, mercury, nickel, PCBs (polychlorinated biphenyls), PCBs (polychlorinated biphenyls, dioxin-like), and selenium. These contaminants are transported into the Delta water system through watersheds that drain into the Delta as a result of agricultural activities, industrial and municipal point sources, urban runoff, and abandoned mine discharges (U.S. EPA, 2007).

GROUNDWATER

The California Department of Water Resources (DWR) delineates state groundwater basins based on geologic and hydrogeologic conditions. The Planning Area is located within the Tracy Groundwater Subbasin (located within the greater San Joaquin Valley Groundwater Basin). The Tracy Groundwater Basin has a surface area of approximately 539 square miles in Contra Costa, Alameda, and San Joaquin Counties and drains north to the San Joaquin River. With the exception of seasonal variations, the majority of wells in the subbasin have remained relatively stable for at least the last 10 years (DWR, 2006).

In the vicinity of the Planning Area, the primary source of recharge is from seepage from streams and percolation of applied irrigation water. Groundwater at East Antioch Creek, at the Trembath Basin, was encountered at 5 feet below ground surface (bgs), and groundwater depth at the site of the Oakley Basin area further east was approximately 15 feet bgs. Groundwater in the vicinity of the Median Station has been recorded at approximately 70 feet bgs (Bay Area Rapid Transit, 2008).

Beneficial Uses

Although no beneficial use is specified for the Tracy Subbasin, unless otherwise designated by the RWQCB, all groundwater is considered suitable, or potentially suitable, for municipal and domestic water supply (SF Bay RWQCB, 2006). The City of Antioch does not use groundwater for its municipal water supply.

Impaired Groundwater

Areas of poor water quality related to elevated concentrations of chloride, nitrate, and boron exist throughout the Tracy Subbasin (DWR, 2006). Within the Planning Area, historical agricultural and industrial land uses and activities resulted in releases of contaminants to groundwater, including agrichemicals, petroleum hydrocarbons. Groundwater remediation and monitoring activities is on-going on multiple parcels within the Planning Area (Dyett & Bhatia, 2008).

REGULATORY FRAMEWORK

Federal Laws and Regulations

Clean Water Act

The Clean Water Act (CWA) was enacted in Congress in 1972 and amended several times since inception. It is the primary federal law regulating water quality in the U.S. and forms the basis for several state and local laws throughout the country. Its objective is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The CWA prescribes the basic federal laws for regulating discharges of pollutants and sets minimum water quality standards for all surface waters in the U.S. At the federal level, the CWA is administered by the U.S.

Environmental Protection Agency (EPA). At the state and regional levels, the CWA is administered and enforced by the State Water Resources Control Board (SWRCB) and the RWQCBs.

FEMA National Flood Insurance Program

FEMA operates the National Flood Insurance Program, which issues maps of Special Flood Hazard Areas (SFHA), based on water surface elevations of the 1 percent (100-year) flood event. For any project that would result in a change to the designated 100-year floodplain, a Conditional Letter of Map Revision (CLOMR) is required to be issued by FEMA prior to the initiation of any construction activities. Upon approval of the proposed changes, FEMA will then issue a CLOMR to modify the elevations and/or boundaries of the Special Flood Hazard Area in question (based on the 100-year flood event). These revisions are then identified on FEMA FIRMs.

FEMA requires assurance by the participating community that minimum floodplain management requirements are complied with, including minimum floor elevations above the "base flood"; that existing lands and structures or proposed structures are "reasonably safe from flooding"; and that all supporting analysis and documentation used to make that determination is on file and available upon request. The supporting hydraulic analysis and documentation includes topographic data and certification by a registered professional engineer or licensed land surveyor.

State Regulations

Porter-Cologne Water Quality Control Act State and Regional Water Quality Control Boards

The Porter-Cologne Water Quality Control Act establishes the SWRCB and the RWQCBs as the principal state agencies having primary responsibility in coordinating and controlling water quality in California. The Porter-Cologne Act establishes the responsibility of the RWQCBs for adopting, implementing, and enforcing water quality control plans (i.e. Basin Plans), which set forth the state's water quality standards (i.e. beneficial uses of surface waters and groundwaters) and the objectives or criteria necessary to protect those beneficial uses. The Project Site lies within the jurisdiction of the San Francisco Bay RWQCB, which has adopted the Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) to implement plans, policies, and provisions for water quality management.

National Pollutant Discharge Elimination System

In 1987, amendments to the CWA added section 402(p), which established a framework to protect water quality by regulating industrial, municipal, and construction-related sources of pollutant discharges to waters of the U.S. In California, the National Pollutant Discharge Elimination System (NPDES) is administered by the SWRCB through the RWQCBs and requires that municipalities obtain permits which outline programs and activities to control storm water pollution. To comply with these regulations, Contra Costa County, the CCFCWCD, and nineteen incorporated cities including the City of Antioch have joined together to create the Contra Costa Clean Water Program (CCCWP). The CCCWP develops and implements specific programs to meet NPDES requirements and consists of a comprehensive plan to reduce the discharge of pollutants to the "maximum extent practicable."

Municipal Storm Water NPDES Permit

The members of the CCCWP receive coverage under a Joint Municipal Storm Water NPDES permit from the SF Bay and Central Valley RWQCBs. The Joint Municipal NPDES permit requires that participating municipalities (i.e. members of the CCCWP) implement an approved storm water management plan. The storm water programs incorporate best management practices (BMPs) that include construction controls (such as a model grading ordinance), legal and regulatory approaches (such as storm water ordinances), public education and industrial outreach (to encourage the reduction of pollutants at various sources), inspection activities, wet-weather monitoring, and special studies.

In 2003, the SF Bay and Central Valley RWQCBs added Provision C.3 to the municipal storm water permit requirements. In accordance with these updated requirements, new development and redevelopment projects that involve the creation or replacement of 10,000 square feet or more of impervious surfaces are required to incorporate treatment measures and other appropriate source control and site design features to reduce the pollutant load in storm water discharges and manage runoff flows. Project site designs must minimize the area of new roofs and paving. Where feasible, pervious surfaces should be used instead of paving so that runoff can percolate to the underlying soil. Runoff from impervious areas must be captured and treated. The municipal permit specifies ways to calculate the required size of treatment devices. Further, in addition to incorporating treatment controls, projects creating or replacing an acre or more of impervious area must also provide flow control so post-project runoff does not exceed estimated pre-project rates and durations.

Construction General NPDES Permit

The SWRCB is the permitting authority in California and has adopted a Statewide General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit) that encompasses one or more acres of soil disturbance. Construction activity includes clearing, grading, excavation, stockpiling, and reconstruction of existing facilities involving removal or replacement.

In general, the NPDES storm water permitting requirements for construction activities require that the landowner and/or contractor submit a notice of intent to the SWRCB and prepare and implement a site-specific storm water pollution prevention plan (SWPPP) to minimize the discharge of pollutants during construction. The SWPPP includes a site map(s) showing the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the site. The SWPPP must also specify BMPs that will be used to protect storm water runoff as well as the placement of those BMPs; a visual monitoring program; a chemical monitoring program for non-visible pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed as an impaired water body for sediment. Measures for erosion and sediment control, construction waste handling and disposal, disposal of groundwater produced during dewatering, and post-construction erosion and sediment control must also be addressed, along with methods to eliminate or reduce non-stormwater discharges to receiving waters.

Regional and Local Regulations

Contra Costa Clean Water Program

The Contra Costa Clean Water Program (CCCWP) is a collaborative effort by Contra Costa County, 19 incorporated cities, and the CCCFWCD, to protect water quality and comply with NPDES requirements. The CCCWP develops and implements specific programs to meet NPDES requirements and provides a comprehensive plan to reduce the discharge of pollutants to the "maximum extent practicable."

Contra Costa County Flood Control and Water Conservation District

The Contra Costa County Flood Control and Water Conservation District (CCCFCWCD) is responsible for flood control throughout the county and assists in the development and implementation of storm drainage infrastructure in both unincorporated and incorporated areas. The CCCFCWCD maintains facilities in their rights-of-ways and easements, including large improved drainage channels, detention basins, and dams that serve as regional drainage facilities. The CCCFCWCD also reviews the drainage aspects of land development applications, flood control and drainage permit applications, and environmental impact documents. Drainage and floodplain permits are required by the CCCFCWCD for construction in flood hazard zones. The CCCFCWCD also administers County Ordinance No. 90-74, which establishes the requirement to collect drainage fees from new development based on the amount of new impervious surfaces. The fees support upgrades to and maintenance of existing drainage systems.

CCCFCWCD Drainage Area Fees

The CCCFCWCD separates their service area into major drainage areas, each of which has an individual master plan and fee schedule intended to ensure that drainage facilities are adequate for anticipated future needs. Where storm drain improvements are needed within parcels under development, the construction of such facilities is designated as a condition of project approval.

The Planning Area is located within CCCFCWCD Drainage Area 56. Drainage area 56 has drainage fees based on $0.069 per square foot for newly created impervious surface area. CCCFCWCD requires payment of fees prior to the filing of final maps, parcel maps, or the issuance of building permits, whichever the case may be within the above drainage areas. (CCCFCWCD, 2007)

CCCFCWCD General Flood Protection Standards

The following general flood standards are required for all structures constructed within a designated floodplain:

1. All new or substantial improvements constructed within a floodplain shall have the finished floor and all electrical and mechanical equipment and/or services elevated one to two feet, minimum, above the Base Flood Elevation (BFE).

2. The area below the BFE plus freeboard, shall be used only for vehicle parking, storage, and building access.

3. Electrical outlets (but not service panels) can be allowed below the BFE plus free board if, and only if, they are of the GFI type.

4. All enclosed space below the BFE shall be adequately ventilated or enclosed with breakaway walls.

5. All tanks (including propane, septic and water) located below BFE shall be anchored.

City of Antioch Municipal Code

Building requirements for floodplain development are specified in Title 9, Chapter 4, Article 20 of the Municipal Code.

Floodplain Development Permits. Municipal Code requires that a development permit be obtained before construction or development begins within any area of special flood hazard. Applications for development permits shall be made on forms furnished by the Floodplain Administrator and may include, but not be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, and drainage facilities; and the location of the foregoing.

Permit requirements include the provision that the proposed development does not adversely affect the carrying capacity of the altered or relocated watercourse such that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point.

City of Antioch General Plan

The Public Services and Facilities element of the City of Antioch General Plan contains several policies related to storm drainage and flood control policies. The Resource Management element contains several policies related to storm water quality. The Environmental Hazards element contains a variety of recommendations for the prevention of damage and injury or death from flooding hazards.

8.7.2 Storm Drainage and Flood Control Policies

a. Continue working with the Contra Costa County Flood Control District to ensure that runoff from new development is adequately handled.

b. Require adequate infrastructure to be in place and operational prior to occupancy of new development, such that:

- new development will not negatively impact the performance of storm drain facilities serving existing developed areas and
- the performance standards set forth in the Growth Management Element will continue to be met.

c. Design flood control within existing creek areas to maximize protection of existing natural settings and habitat.

d. Provide retention basins in recreation areas where feasible to reduce increases in the amount of runoff resulting from new development.

e. Require new developments to provide erosion and sedimentation control measures to maintain the capacity of area storm drains and protect water quality.

f. Require implementation of Best Management Practices in the design of drainage systems to reduce discharge of non-point source pollutants originating in streets, parking lots, paved industrial work areas, and open spaces involved with pesticide applications.

10.7.2 Water Resources Policies

f. Require public and private development projects to be in compliance with applicable National Pollution Discharge Elimination System (NPDES) permit requirements, and require the implementation of best management practices to minimize erosion and sedimentation resulting from new development.

g. Participate in regional watershed planning efforts to enhance area water quality.

h. Design drainage within urban areas to avoid runoff from landscaped areas and impervious surfaces from carrying pesticides, fertilizers, and urban and other contaminants into natural streams.

11.4.2 Flood Protection Policies

a. Prohibit all development within the 100-year floodplain, unless mitigation measures consistent with the National Flood Insurance Program are provided.

b. Minimize encroachment of development adjacent to the floodway in order to convey flood flows without property damage and risk to public safety. Require such development to the capable of withstanding flooding and to minimize the use of fill.

c. Prohibit alteration of floodways and channelization of natural creeks if alternative methods of flood control are technically and financially feasible. The intent of this policy is to balance the need for protection devices with land use solutions, recreation needs, and habitat preservation.

d. Require new development to prepare drainage studies to assess storm runoff impacts on the local and regional storm drain and flood control system, along with implementation of appropriate detention and drainage facilities to ensure that the community's storm drainage system capacity will be maintained and peak flow limitations will not be exceeded.

e. Where construction of a retention basin is needed to support new development, require the development to provide for the perpetual funding and ongoing maintenance of the basin.

f. Eliminate hazards caused by local flooding through improvements to the area's storm drain system or creek corridors.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact if the Plan would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding,including flooding as a result of the failure of a levee or dam;
- Inundation by seiche, tsunami, or mudflow; or
- Provide sufficient facilities development to protect structures for human occupancy and roadways identified as evacuation routes from inundation during the 100-year flood event.

METHODOLOGY AND ASSUMPTIONS

This impact analysis focused on potential effects on water quality, drainage patterns, and floodplains associated with implementation of the Hillcrest Station Area Specific Plan. The evaluation was made in light of current conditions in the Planning Area, proposed future land uses under the proposed Plan, and applicable regulations and guidelines.

SUMMARY OF IMPACTS

Construction-related impacts on water quality would be reduced by compliance with NPDES General Construction Permit requirements. Long-term impacts to water quality would be mitigated through adherence to the requirements of Provision C.3 of the NPDES Municipal Stormwater Permit. The increased intensity of land uses and development within a designated

100-year flood hazard zone could increase flood hazards on- and off-site, but cooperative flood management planning with CCCFCWCD would ensure appropriate flood control improvements are implemented to address future storm flows. The Planning Area is not subject to inundation by seiche, tsunami, or mudflow; therefore, no impacts related to these hazards would result. Implementation of the Hillcrest Station Area Specific Plan would not deplete local groundwater supplies, nor would it significantly affect groundwater recharge or elevations.

IMPACTS AND MITIGATION MEASURES

3.9-1 *Project construction activities could result in increased erosion and sedimentation, resulting in adverse impacts to water quality along East Antioch Creek and downstream waterbodies. (Less than Significant)*

Construction activities, such as site clearing, grading, and excavation, can result in a temporary increase in soil erosion. During the construction period, exposed soils from soil stockpiles and excavated area can be transported by wind or water and, if not managed properly, can accumulate in storm drains and nearby waterbodies, restricting stormflows, reducing storage capacity, and adversely affecting water quality.

Construction activities can also result in the accidental release of hazardous waste products such as adhesives, solvents, paints, and drilling and petroleum lubricants that, if not managed appropriately, can adhere to soil particles, become mobilized by rain or runoff, and degrade water quality. Hazardous waste products used during construction could also infiltrate into groundwater and degrade groundwater quality.

Under the proposed Specific Plan, project construction activities would be required to comply with the City of Antioch's standard conditions of approval regarding grading, drainage, and erosion and sedimentation control, and NPDES General Construction Permit requirements. Full compliance with these standard conditions of approval and NPDES requirements would maintain construction-related erosion impacts at less than significant levels.

As required by City of Antioch Municipal Code, all construction activities are required to implement generally accepted engineering practices for erosion control as deemed necessary by the City Engineer. Construction activities resulting in the disturbance of more than one acre of land would also comply with the NPDES General Construction Permit requirements. In accordance with NPDES permit requirements, project applicant(s) would first submit a Notice of Intent to the SWRCB that includes general information on the types of construction activities that would occur at the site. The applicant(s) or its contractor(s) would develop and submit a Stormwater Pollution Prevention Plan (SWPPP) to the SWRCB describing the erosion control and storm water quality best management practices (BMPs) that would be employed to reduce storm water pollutants to the Maximum Extent Practicable. Construction contractors would be responsible for implementation of the SWPPP, including maintenance, inspection, and repair of BMPs throughout the construction period. Mandatory compliance with the NPDES General Construction Permit requirements and implementation of the site-specific SWPPP would control and reduce discharges of sediments and pollutants associated with runoff from the Planning Area during construction into East Antioch Creek and downstream receiving waters.

Specific Plan Policy that Reduces the Impact

EH-45 Development projects in the Station Area shall comply with the requirements of Provision C.3 of the NPDES Municipal Stormwater Permit issued to the Contra Costa County Clean Water Program. As required by the C.3 Provisions, building permit applications must be accompanied by a Stormwater Control Plan, for review and approval by the City Engineer, which specifies the treatment measures and appropriate source control and site design features that will be incorporated into project design and construction to reduce the pollutant load in storm water discharges and manage runoff flows.

EH-46 Design storm drainage and flood control structures to minimize erosion and creek sedimentation, and to preserve and enhance the wildlife habitat and vegetation of East Antioch Creek.

Mitigation Measures

No mitigation measures required.

3.9-2 ***New and increased intensity of urban land uses could result in increased levels of non-point source pollutants in storm water runoff, adversely affecting water quality in receiving waterbodies and East Antioch Creek. (Less than Significant)***

Implementation of the Hillcrest Station Area Specific Plan would result in an increase in the intensity of urban land uses in the Planning Area, including associated traffic increases. The increase in impervious surfaces and the influx of a larger number of residents, workers, and visitors to the area could result in an increase in non-point source (NPS) pollutants in stormwater runoff. Common NPS pollutants include nutrients, oil and grease, metals, pesticides, and gross pollutants (including bacteria) that are washed by rainwater from rooftops, landscape areas, and streets and parking areas into the drainage network. Pollutant concentrations in site runoff are dependent on a number of factors including: (1) land use conditions; (2) site drainage conditions; (3) intensity and duration of rainfall; (4) the climatic conditions preceding the rainfall event; and (5) implementation of water quality BMPs. Due to the variability of urban runoff characteristics, it is difficult to estimate pollutant loads for NPS pollutants. However, pollutants from the Planning Area would be consistent with residential areas, commercial areas, landscape areas, and parking lots. Elevated levels of oil and grease, petroleum hydrocarbons, metals, and nutrients in site runoff are likely. Without proper mitigation, implementation of the Hillcrest Station Area Specific Plan could contribute to NPS pollutants in East Antioch Creek and the San Joaquin River, and adversely affect water quality.

New development under the proposed Plan would be required to comply with Provision C.3 of the NPDES Municipal Storm Water Permit. In accordance with these updated requirements, new development and redevelopment projects that involve the creation or replacement of 10,000 square feet or more of impervious surfaces are required to incorporate treatment measures and other appropriate source control and site design features to reduce the pollutant load in storm water discharges and manage runoff flows. The municipal permit specifies ways to calculate the required size of treatment devices. Also, in addition to incorporating treatment controls, projects creating or replacing an acre or more of impervious area must also provide flow control so post-project runoff does not exceed estimated pre-project rates and durations. Applicants for individual development approvals must submit a Stormwater Control Plan in accordance with the criteria in

the *Contra Costa Clean Water Program's Stormwater C.3 Guidebook*. The Stormwater Control Plan must demonstrate that the project would not increase stormwater flows and include the necessary stormwater treatment facilities and measures to control pollutant sources.

Full compliance with NPDES C.3 Provisions and the proposed Plan policies listed under Impact 3.9-1 would ensure that impacts related to NPS pollutants and post-construction storm water quality are less than significant.

Mitigation Measures

No mitigation measures required.

3.9-3 *Future development within FEMA 100-year flood hazard zones could pose significant risks to structures, human health, and private property. (Less than Significant)*

Official FEMA FIRMs indicate portions of the Planning Area lie within 100-year flood hazard zones. Areas subject to inundation during the 100-year flood event include a 100- to 300-foot-wide band along the East Antioch Creek channel, the wetland complex in the northeast corner of the Planning Area, and the Oakley and Trembath Detention Basins. Future structures, homes, occupants, and workers in the designated floodplain would be exposed to increased flood hazards. Development in the 100-year flood hazard zone could also impede or redirect flood flows, reduce the carrying capacity of East Antioch Creek, and/or displace flood flows to other areas on- or off-site not currently designated as 100-year flood hazard zones.

The damage caused by a flood event is dependent upon several factors including rainfall distribution, impervious vs. pervious land cover, soil infiltration rates, and the capacity of drainage and flood storage facilities. Depending on the severity of the flood event, flood flows are capable of causing massive erosion and sedimentation, damaging structures and private property, obstructing emergency access or evacuation, and endangering human health and safety.

Both the CCCFCWCD General Flood Protection Standards and the City of Antioch Municipal Code contain provisions pertaining to development within the 100-year floodplain. These provisions are designed to reduce future losses associated with flooding events and to comply with regulations stipulated by FEMA and the National Flood Insurance Program.

Per the municipal code, applications for a floodplain development permit shall be made on forms furnished by the Floodplain Administrator and include, but not be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, and drainage facilities; and the location of the foregoing. Specifically, the following information is required:

1) Proposed elevation, in relation to mean sea level, of the lowest floor (including basement) of all structures in Zone AO, elevation of highest adjacent grade and proposed elevation of lowest floor of all structures; or
2) The proposed elevation in relation to the mean sea level to which any structure will be flood-proofed;
3) All appropriate certifications listed in subdivision (4) of division (C) of this section; and

4) A description of the extent to which any watercourse will be altered or relocated as a result of the proposed development.

The City of Antioch Municipal Code specifies that the net effect of any development in the floodplain may not increase the area, velocity, or elevation of floodwaters within the floodway, unless such changes are part of a flood control plan. Project approvals are conditioned by the provision that no increase in flooding will result. Floodplain development permit applications are reviewed by the Floodplain Administrator who determines whether all requirements have been satisfied and either grant or deny the permits.

CCCFCWCD oversees flood control and assists in the development and implementation of storm drainage infrastructure within the City of Antioch and the Planning Area. Areas of special flood hazards are subject to a number of flood protection standards imposed by CCCFCWCD. All new or substantial improvements within a floodplain must have the lowest floor and all electrical and mechanical equipment and services elevated a minimum of one foot above the base flood elevation plus required freeboard, and be flood-proofed such that below the base flood elevation the structure is watertight with walls substantially impermeable to the passage of water. All new improvements shall be anchored to prevent floatation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.

Plans by CCCFCWCD to expand the Oakley Detention Basin and construct the Trembath Detention Basin would serve to reduce peak runoff into the main channel of East Antioch Creek during periods of heavy rainfall, increase flood storage, and control downstream flooding. With these improvements in place, the two basins would have a combined storage capacity to accommodate the 100-year storm event. Although funding for these drainage improvements has been secured, a schedule for implementation has not been determined.

The location of the Planning Area along the East Antioch Creek channel and within a FEMA-designated floodplain indicates that area-wide planning must be employed, and special construction methods applied to development within flood-prone areas. Regional flooding mitigation for floodplain development and loss of flood storage must be developed in coordination with CCCFCWCD requirements. Overall floodplain mitigation for implementation of the Hillcrest Station Area Specific Plan would be described in the Master Drainage and Flood Management Plan prescribed by proposed Specific Plan policies. In addition, funding and responsibility for long-term maintenance of the flood control improvements would be assigned as part of the Master Plan.

Comprehensive flood management planning in advance of zoning permits would also ensure implementation of the Hillcrest Station Area Specific Plan would not result in exacerbated flooding on- or off-site.

Proposed high-density development under the proposed Specific Plan would be subject to flood hazards and could result in the displacement of flood flows such that other on- or off-site areas are affected. In addition to the 15.7 acres of 100-year floodplain in the vicinity of the wetland complex in the northeast corner of the Planning Area, development under the proposed Plan would also encroach on the 100-year floodplain of East Antioch Creek in the vicinity of Willow Avenue (approximately 0.6 acres). It is anticipated that encroached upon floodplains will be filled and leveled as part of the grading and development. The majority of the floodplain areas along the East Antioch Creek corridor is designated as part of the wetland buffer and open space.

Mandatory compliance with flood control standards established by FEMA and adopted by CCCFCWCD and the City of Antioch, and coordination with CCCFCWCD regarding flood control improvements would help to reduce flooding impacts to less than significant levels.

Specific Plan Policies that Reduce the Impact

UT-1 Prior to approval of any land subdivisions or development projects within the Hillcrest Station Area, a Drainage and Flood Management Master Plan shall be prepared in collaboration with Contra Costa County Flood Control and Water Conservation District, the City of Antioch Public Works Department, the City of Antioch Planning Department, and the City of Antioch Parks and Recreation Department. The Plan shall:

- Document the overall drainage and flood control concept to be employed within the Hillcrest Station Area to ensure adequate and safe storm flows and to minimize flooding;
- Address funding and responsibility for long-term maintenance of the flood control improvements;
- Demonstrate how the natural hydrologic functions of the site are integrated with the storm drainage system and the overall site design, to the maximum extent feasible; and,
- Identify how improvements can be phased for each development area.

UT-2 Continue the Contra Costa County Flood Control and Water Conservation District Drainage Area Fee Program to fund flood control improvements in the Hillcrest Station Area.

UT-3 Ensure that new development provides needed drainage and flood protection improvements in proportion to a project's impacts, to assure an equitable distribution of costs to construct and maintain drainage infrastructure. Construct new trunk mains along the backbone street alignments and provide connections into East Antioch Creek, as shown conceptually in Figure 6-2, Existing and Future Storm Drains.

UT-4 Minimize total impervious areas by allowing narrow road sections and shared driveways, and using pervious materials on driveways, gutters, and off-street parking areas, where appropriate.

C-7 Promote the use of permeable paving for parking aisles, off-street bike lanes, and parking lots, where feasible.

Mitigation Measures

No mitigation measures required.

3.9-4 *Implementation of the Hillcrest Station Area Specific Plan would alter existing drainage patterns, potentially affecting the volume and/or timing of peak runoff in the municipal storm drain system. (Less than Significant)*

The majority of the Planning Area is currently undeveloped or vacant. A few homes and some industrial uses exist, including a car towing and storage yard and metal smelting facility. Much of the Planning Area is characterized by nonnative grassland, freshwater marsh, and wetlands. Implementation of the Hillcrest Station Area Specific Plan would decrease natural ground cover and increase impervious surfaces (such as paved areas and buildings). Surface water runoff volumes and rates generated from undeveloped, unpaved areas can increase significantly when a site is paved, the impervious surface area increased, and the capability of surface water infiltration reduced or eliminated. Increased runoff volume and peak discharge rates could exacerbate downstream drainage problems, particularly if the capacity of downstream infrastructure is inadequate. Increased detention basin capacity and improvements and expansion of the storm drainage network would be necessary to accommodate future storm flows, provide adequate drainage, and control flooding.

Future expansion of the Oakley Detention Basin and development of the Trembath Basin by CCCFCWCD would serve to reduce peak runoff into the main channel of East Antioch Creek, maintain safe flows, and control downstream flooding during periods of heavy rainfall. The planned improvements to the basins were designed to accommodate runoff from the Planning Area. However, the land use assumptions that were used to plan these improvements must be compared to the land uses and densities proposed in the Specific Plan. Additional detention may be required. As of October 2008, negotiations between private landowners and CCCFCWCD to secure the land and/or flowage easements needed for the planned improvements have not taken place.

In accordance with Provision C.3 of the NPDES Municipal Storm Water Permit, every application for a development project, including but not limited to a rezoning, tentative map, parcel map, conditional use permit, variance, site development permit, design review, or building permit that is subject to the development runoff requirements in the city's NPDES permit must be accompanied by a Stormwater Control Plan that meets the criteria in the most recent version of the *Contra Costa Clean Water Program's Stormwater C.3 Guidebook*. Projects creating or replacing an acre or more of impervious area must provide flow control to ensure post-project runoff does not exceed estimated pre-project rates and durations. The Stormwater Control Plan must demonstrate that the project would not increase storm water flows and include the necessary storm water treatment facilities and measures to control pollutant sources.

Development under the proposed Plan would involve high density residential, office, retail, entertainment, and hospitality uses throughout the Planning Area. Open space would be limited to the East Antioch Creek channel, landscape buffers, and small parks. Surface water runoff volumes and rates are anticipated to increase significantly when the majority of the area is paved and developed. Compliance with the C.3 Provisions of the NPDES Municipal Stormwater Permit, coupled with CCCFCWCD improvements to the Oakley and Trembath Detention Basins in place, would reduce potential impacts related to increases in storm water runoff rates and volume to less than significant.

Specific Plan Measures that Reduce the Impact

Specific Plan policies listed under Impact 3.9-1 and 3.9-3 would contribute to reducing this impact to less than significant levels.

Mitigation Measures

No mitigation measures required.

3.9-5 ***Implementation of the Hillcrest Station Area Specific Plan could inhibit the infiltration of storm water runoff to groundwater, thereby reducing groundwater recharge and aquifer volume. (Less than Significant)***

Potable water supplies for the Planning Area would be derived from surface water sources and would not deplete local groundwater supplies. Water supplies for the City of Antioch and future land uses in the Planning Area would be served by water purchased from Contra Costa Water District, which draws its water from the Sacramento-San Joaquin Delta, and by water pumped by the City of Antioch from the San Joaquin River.

Aside from seasonal variations, groundwater levels in the Tracy subbasin are relatively stable (DWR, 2006). Although an increase in impervious surfaces could inhibit the infiltration of storm water runoff to groundwater within developed areas, planned improvements to the Trembath and Oakley Detention Basins would promote infiltration of storm water. Potential impacts related to groundwater recharge and groundwater levels would be less than significant.

Specific Plan Measures that Reduce the Impact

Specific Plan policies listed under Impact 3.9-1 and 3.9-3 would contribute to reducing this impact to less than significant levels.

Mitigation Measures

No mitigation measures required.

CUMULATIVE IMPACTS

3.9-6 ***Construction activities and urban development resulting from implementation of the Hillcrest Station Area Specific Plan, in conjunction with other foreseeable development in the city, would not result in cumulatively considerable impacts on hydrology and water quality conditions. (Less than Significant)***

Implementation of the Hillcrest Station Area Specific Plan coupled with other reasonably foreseeable future projects in the City would result in adverse cumulative effects on hydrology and water quality including construction impacts related to increases in stormwater runoff and pollutant loading to the East Antioch Creek and San Joaquin River. Future projects, including future development projects under both alternatives of the Hillcrest Station Area Specific Plan, would be required to comply with NPDES C.3 Provision requirements regulate water quality and control runoff and regulate water quality at each development site. New projects would be required to demonstrate that stormwater volumes could be managed by downstream conveyance facilities and would not induce flooding. Therefore, cumulative effects on water quality, drainage, and flooding, in combination with other foreseeable projects, would be less than significant.

Specific Plan Policies that Reduce the Impact:

Specific Plan policies listed under Impact 3.9-1 and 3.9-3 would contribute to reducing this impact to less than significant levels.

Mitigation Measures

No mitigation measures required.

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3.10 Land Use

This section presents the environmental setting pertaining to land use, population growth, and housing in the Hillcrest Station Area Specific Plan area. The proposed project, including the Specific Plan and General Plan amendment, are analyzed for consistency with adopted land use policies. Potential impacts related to housing supply and population are analyzed, including potential displacement of residential and business uses. There are no state-classified agricultural soils of importance within the Planning Area; therefore, agricultural impacts are not addressed in this EIR.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

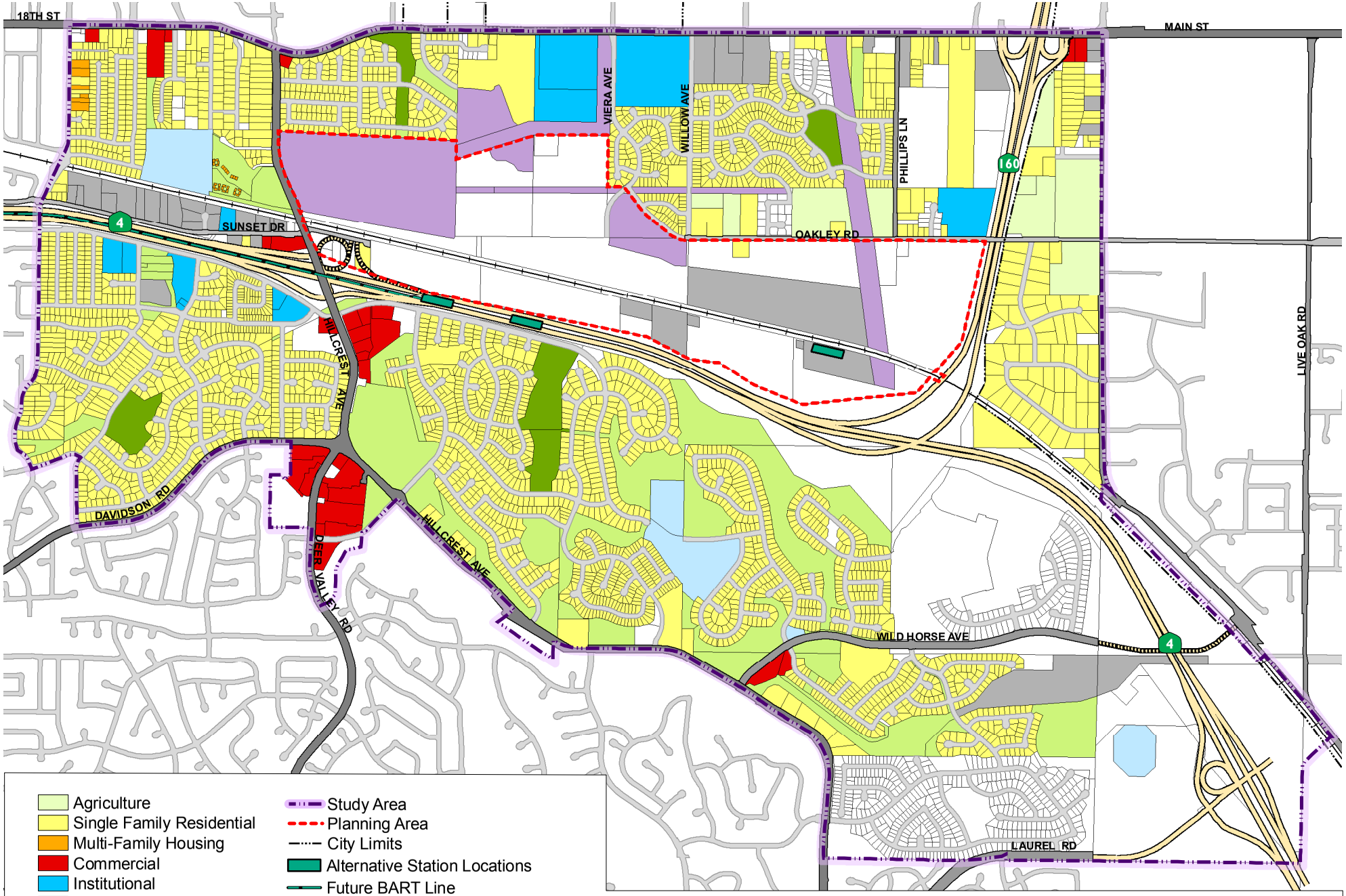
Land Use

Currently, the Hillcrest Station Area is primarily vacant. A portion of it is characterized by wetlands and stormwater detention basins along East Antioch Creek. There are some existing industrial uses, including a car towing and storage yard, and an aluminum casting facility (operations ended in January 2008). There are approximately five houses on the site, though at least one appears to be abandoned. The northwest corner of the site is occupied by the PG&E Hillcrest Yard and Substation (70 acres) and the southwest corner is the BART park-and-ride facility (5.2 acres).

Immediately surrounding the Planning Area are the SR 4 and SR 160 corridors, residential neighborhoods, agriculture uses, a church, cemeteries, and office uses. There are three parks in nearby residential neighborhoods. East Antioch Creek and the detention basins also serve as a physical and visual separation between the Planning Area and the areas to the north that include two cemeteries and residential neighborhoods. A large church is located above the northeast corner near the Oakley Road/SR 160 over-crossing. Along Oakley Road adjacent to the Planning Area, in addition to the church, there are agriculture and residential uses. The City has reviewed plans to convert some of the agriculture areas to single-family residential uses. SR 4 and the existing hills to the south create a physical and visual barrier, so there is little integration between the Planning Area and the neighborhoods to the south of Planning Area. SR 160 is another physical and visual barrier between the Planning Area and the portion of Oakley directly to the east. Figure 3.10-1 shows existing land use in and near the Planning Area.

Adopted Land Use Plans and Regulations

The land use in the Planning Area is currently regulated by the Antioch General Plan, Zoning Ordinance, and Redevelopment Project Area Plan. In addition, because this Specific Plan has been completed in response to proposed public transit improvements, namely the eBART Project, the Station Area is subject to the Metropolitan Transportation Commission (MTC) Resolution 3434 and the BART System Expansion Project. The City of Antioch is not a signatory on the Contra Costa County Habitat Conservation Plan. The applicable plans are described in the regulatory setting section below.



Hillcrest Station Area Specific Plan

Figure 3.10-1: Existing Land Use

Source: Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.

Population and Housing

The existing demographics have been evaluated for the areas within one-half mile of each alternative station location. The one-half miles radius is the area for which BART and MTC will evaluate the total number of housing units and potential riders for the eBART line. Table 3.10-1 summarizes the existing station area population demographics. The Median Station is the proposed station location; the East Median Station is an alternative location to the proposed station; and the Phillips Lane Station is a potential second station that would be built by the project sponsor at some point in the future.

Table 3.10-1 Station Area Demographic Data (2007)

	Median	*East Median*	*Phillips Lane*
Population			
Persons	3,121	2,845	1,328
Households	982	870	390
Persons per Household	3.18	3.27	3.40
Housing			
Housing Units	999	887	399
Owners	85.8%	87.6%	85.7%
Renters	12.6%	10.5%	12.0%

Note: Station areas are defined by a one-half mile radius around proposed stations. To estimate population and household data for the radius, Claritas identifies all Census Block Groups that lie wholly or partially within the specified radius. For Block Groups that are wholly within the radius, all person and household data is included. For Block Groups that are only partially within the specified radius, Claritas uses a proprietary methodology to assign data to the radius. In simplified terms, Claritas assigns data to the radius in proportion to the amount of the Block Group that lies within the radius.

Source: East Contra Costa BART Extension Draft EIR, September 2008.

The Association of Bay Area Governments (ABAG) updates its growth projections annually. In 2007, the demographic information indicated that the City of Antioch's population and number of households each grew approximately 12 percent between 2000 and 2005, while the number of jobs grew four percent. Between 2005 and 2010 it is anticipated that population and household growth will slow to a four percent gain, while the number of jobs will increase by more than ten percent. ABAG projects that the population and household growth will continue to be slower than job growth through 2035. Between 2005 and 2035, Antioch is expected to grow by 26,900 residents, 10,510 households, and 20,290 jobs. Based on these projections, the ratio of jobs per household will increase from 0.63 in 2005 to 0.94 in 2035. Table 3.10-2 summarizes the projected growth for the City of Antioch.

Table 3.10-2 ABAG Projections for the City of Antioch

Year	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*	*2030*	*2035*
Population	90,532	101,500	106,000	110,400	115,000	119,600	124,000	128,400
Percent Growth		12%	4%	4%	4%	4%	4%	4%
Households	29,338	32,760	34,560	36,360	38,090	39,890	41,580	43,270
Percent Growth		12%	5%	5%	5%	5%	4%	4%
Jobs	19,700	20,510	22,680	25,930	29,350	33,000	36,750	40,800
Percent Growth		4%	11%	14%	13%	12%	11%	11%
Jobs/Household Ratio	0.67	0.63	0.66	0.71	0.77	0.83	0.88	0.94

Source: ABAG Projections 2007.

REGULATORY SETTING

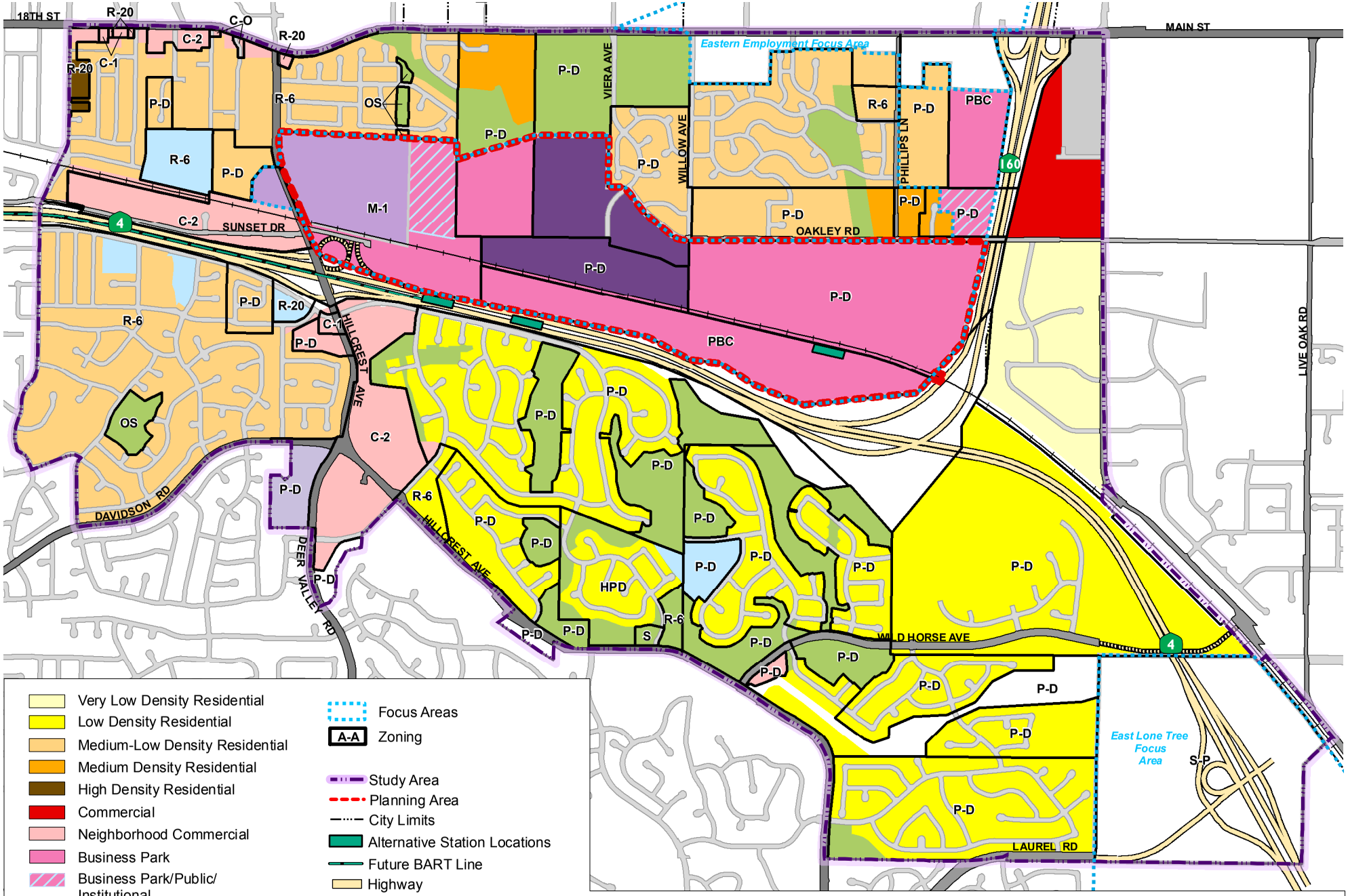
State Regulations

California Relocation Assistance and Real Property Acquisition Guidelines

The California Government Code requires that relocation assistance be provided to any person, business, or farm operation displaced because of the acquisition of real property by a public entity for public use (Title 25 California Code of Regulations, Chapter 6, Section 6000 et seq.). In addition, comparable replacement properties must be available for each displaced person within a reasonable period of time prior to displacement. The California Relocation Assistance Guidelines mandate that certain relocation services and payments be made available to eligible residents, businesses, and nonprofit organizations displaced by construction and operation of transit-related projects. The Guidelines establish uniform and equitable procedures for land acquisition, and provides for uniform and equitable treatment of persons displaced from their homes, businesses, or farms by state and state-assisted programs.

California Community Redevelopment Law

California's Community Redevelopment Act (CRA) was enacted in 1945 to address blight and decay in California cities. California Health and Safety Code Sections 33000-34160 contain the Community Redevelopment Law. Redevelopment is a process authorized under California law that enables local government entities to identify deteriorated and blighted areas in their jurisdictions in need of revitalization. "Redevelopment" means the planning, development, re-planning, redesign, clearance, reconstruction, or rehabilitation, or any combination of these, of all or part of a survey area, and the provision of those residential, commercial, industrial, public, or other structures or spaces as may be appropriate or necessary in the interest of the general welfare, including recreational and other facilities incidental or appurtenant to them. In addition, redevelopment agencies are required to deposit 20 percent of the property tax revenues generated from their activities into a special fund called a "Low- and Moderate-Income Housing Fund." These funds can only be used for the purpose of increasing, improving, and preserving the community's supply of affordable housing for very low-, low-, or moderate-income households.



Hillcrest Station Area Specific Plan

Figure 3.10-2: General Plan Land Use & Zoning

Source: Contra Costa County, 2008; City of Antioch, 2007; City of Oakley, 2008.

Local Regulations

Antioch General Plan Land Use Designations

Even though there is minimal development in the Planning Area at this time, the 2003 General Plan designated the area for substantial development. The Planning Area encompasses the majority of the SR 4 Industrial Frontage Focus Area identified in the General Plan. The majority of the Planning Area (64 percent) is designated as Business Park. Less than 20 percent is designated as Transit-Oriented Development. Table 3.10-3 summarizes the land uses designated by the General Plan. Figure 3.10-2 illustrates the General Plan land uses as color blocks and the Zoning Districts are labeled and outlined in black.

Table 3.10-3 Planning Area General Plan Land Use Designations

Land Use	*Acres*	*Percent of Total*
Transit-Oriented Development	73.1	19%
Business Park	241.0	64%
Business Park/Public/Institutional	17.5	5%
Other (PG&E, ROW, etc.)	43.6	12%
Total	**375.2**	**100%**

Source: City of Antioch General Plan (2003), GIS (2007), Dyett & Bhatia (2008)

- **SR 4 Industrial Frontage Focus Area.** The General Plan policy direction for the SR 4 Industrial Frontage Focus Area indicates that the area should be developed based on transit-oriented development principles. "A mix of office, business park, light industrial uses, none of which rely on intensive use of heavy trucks, will be located within walking distance of high density housing, retail commercial, and the rail transit station and parking areas serving the station." The freeway frontage should be available for higher end business park office, showroom retail, and commercial uses.
- **Transit-Oriented Development.** The primary purpose of areas designated "Transit-Oriented Development" (TOD) is to provide for a mix of high density uses oriented toward rail transit stations within and adjacent to Antioch. TOD is defined as an integrated mix of residential, commercial, and employment-generating uses. Both horizontal mixed-use and vertical mixed-use projects are appropriate in this area. Development is to be high-density to facilitate pedestrian and bicycle use, and shall provide easy access to the adjacent transit station.
- **Business Park.** Areas designated "Business Park" are intended for employment-generating uses compatible with a location adjacent to residential neighborhoods as a transition from high intensity transit-oriented development, as well as other industrial uses. Commercial development, including automotive sales, should be clustered along the freeway frontage.
- **Business Park/Public/Institutional.** This designation was applied to the undeveloped portion of the PG&E site.

General Plan Buildout Projections

A detailed analysis of the General Plan shows that approximately 3.5 million square feet of commercial space, and 1,200 housing units, is a realistic projection of growth allowed under the existing General Plan. This level of development would support about 4,035 jobs, as well as 2,400 new residents.

Table 3.10-4 General Plan Buildout Projections

Land Use	*Units*	*Retail SF*	*Office SF*	*Jobs*
Transit Oriented Development	1,200	500,000		1,000
Business Park			3,000,000	3,000
Business Park/Public/Institutional				35
Other (PG&E, ROW)				
Total	**1,200**	**500,000**	**3,000,000**	**4,035**

Source: City of Antioch General Plan (2003), GIS (2007),Zoning Ordinance (2008); Dyett & Bhatia (2008)

Antioch Zoning Ordinance

The majority of the Planning Area, 57 percent, has been zoned as Planned Development. Approximately 25 percent of the area is designated as Light Industrial and another 19 percent is Planned Business Center. Zoning districts are outlined in black on Figure 3.10-2.

Table 3.10-5 Planning Area Zoning Districts

Zoning District	*Acres*	*Percent of Total*
Planned Business Center (PBC)	70.5	19%
Planned Development (P-D)	213.6	57%
Light Industrial (M-1)	90.4	24%
Other	0.7	<1%
Total	**375.2**	

Note: Planned Development is a district in the Antioch zoning code.

Source: City of Antioch GIS (2007), Dyett and Bhatia (2008)

- **Planned Business Center (PBC).** The district provides sites in landscaped settings for office centers, research and development facilities, limited industrial activities (including production and assembly, but no raw materials processing or bulk handling), limited warehouse type retail and commercial activities, and small-scale warehousing distribution. Individual business centers would have a common architectural and landscape treatment, while architectural variation is encouraged between centers.
- **Planned Development (P-D).** This district accommodates various types of development, such as neighborhood and district shopping centers, professional and administrative office, multiple-family housing developments, single-family residential developments, commercial service centers, and industrial parks, or any other use or combination of uses which are appropriately a part of a planned development.

This district is intended to enable and encourage flexibility in the design and development of land so as to promote its most appropriate use; to allow diversification in the relationship of various uses, structures and space; to facilitate the adequate and economical provision of streets and utilities; to preserve the natural and scenic qualities of open space; to offer recreational opportunities convenient to residents to enhance the appearance of neighborhoods through the preservation of natural green spaces; and to counteract the effects of urban congestion and monotony.

- **Light Industrial (M-1).** This district allows light industrial uses and excludes those heavy industrial uses with potentially hazardous or negative effects. Uses include the fabrication, assemble, processing, treatment, or packaging of finished parts or products from previously prepared materials typically within an enclosed building.

Redevelopment Project Area Number 3

In 1986, the City of Antioch adopted Redevelopment Project Area Number 3. The 236-acre Project Area is generally bounded by State Route 4 (SR 4), Hillcrest Avenue, and Oakley Road. It does not include any land north of Oakley Road. Project Area No. 3 was adopted to:

- Eliminate environmental deficiencies such as obsolete buildings, inadequate public improvements, and uneconomic land uses;
- Assemble land into parcels suitable for modern integrated development with improved pedestrian and vehicular circulation;
- Develop undeveloped areas which are stagnant or improperly utilized;
- Strengthen the economic base of the area and community by installing needed site improvements to stimulate commercial/light industrial expansion, employment, and economic growth;
- Provide adequate land for parking and open space;
- Establish and implement performance criteria to assure sufficiency of site design standards and environmental quality, and other design elements which provide unity and integrity to the entire project;
- Expand or improve the community's supply of low- and moderate-income housing and senior citizen housing; and,
- Provide opportunities for owners and tenants to participate in the revitalization of their properties.

At the time, the Redevelopment Plan conformed to the General Plan. Land uses designated by the Plan included Industrial, Commercial, Residential, and Mixed Uses, as reflected in the 1986 General Plan Land Use Map.

East Antioch Specific Plan

In April 1981, the City of Antioch adopted the East Antioch Specific Plan for the 677-acre area bounded by East 18th Street on the north, SR 4 on the south and east, and existing City limits along the eastern boundary of the PG&E parcel on the west. The land use plan concept was to guide the development of the primarily undeveloped area into a low density residential area while providing for future employment opportunities and protecting the natural features. The 1981 East Antioch Specific Plan was superseded by the 2003 Antioch General Plan Update.

Metropolitan Transportation Commission Resolution 3434

The MTC regional TOD policy was adopted in 2005 to aid jurisdictions in addressing multiple goals: improving the cost effectiveness of regional investments in new transit expansions, easing the Bay Area's chronic housing shortage, creating vibrant new communities, and helping preserve regional open space. The policy applies to all physical transit extensions funded by Resolution 3434, including the eBART Project. It establishes corridor-level thresholds to quantify appropriate minimum levels of development around transit stations along new corridors, requires that local jurisdictions adopt a Station Area Plan that demonstrates how the jurisdiction plans to meet the development thresholds, and requires multi-agency planning to define expectations, timelines, roles, and responsibilities for key stages of the transit project development process. For commuter rail projects such as eBART, MTC requires that there be an average of 2,200 housing units per station. For the eBART Project, which has three proposed stations, there must be a total of 6,600 housing units in the eBART corridor. The units must be located within one-half mile of the three stations.

BART System Expansion Policy

BART adopted a System Expansion Policy as part of its Strategic Plan in 1999. The policy requires that at least one Ridership Development Plan (RDP) be undertaken for any proposed expansion project. The RDP(s) must demonstrate that a corridor-wide ridership threshold can be achieved through measures such as transit-supportive land use and investment in access programs and projects. The eBART project expansion policy target is 5,801 weekday entries and exits in 2030. The projected ridership is 10,100 entries and exits by 2030 for the entire corridor.

Antioch General Plan Growth Management Element

3.6.2 Growth Management: Rate of Growth Policies

a. Limit the issuance of development allocations to a maximum annual average of 600, recognizing that the actual rate of growth will vary from year to year. Thus, unused development allocations may be reallocated in subsequent years, and development allocations may be moved forward from future years, provided that the annual average of 600 development allocations may not be exceeded during any given five-year period (i.e., no more than 3,000 development allocations may be issued for any given five-year period).

b. To move development allocations forward from future years, the following finding must be made: The constraints posed by needed infrastructure phasing or capital facilities financing require that development allocations be moved forward from future years to avoid jeopardizing the feasibility of existing infrastructure financing mechanisms or the financing of infrastructure for the development allocations that would otherwise be granted during the calendar year.

c. To facilitate the development of housing required to meet the needs of all economic segments of the community and special needs groups identified in the Housing Element, age-restricted housing and multiple-family dwellings shall be counted as less than one single family dwelling unit for the purposes of residential development allocations. The relationship between an allocation for a single-family dwelling and an allocation for age-restricted housing and multiple-family dwellings shall be based on such factors as differences in traffic generation, school impacts, and demand for new recreation facilities.

d. In order to avoid a predominance of any one housing type, limits shall be placed on the number of annual allocations that may be granted to age-restricted senior housing, single family detached housing, and multifamily housing.

e. Permit residential projects that are subject to limitations on development allocations to proceed with other necessary approvals not directly resulting in the division of land or construction of residential dwelling units (e.g., General Plan amendments, rezoning, environmental review, annexation, etc.). The processing of such applications is not, however, a commitment on the part of the City that the proposal will ultimately receive development entitlements or allocations.

f. To facilitate the development of housing required to meet the needs of all economic segments of the community and special needs groups identified in the Housing Element, exempt the following types of developments from limitations on the annual issuance of development allocations, whether for single-family or multi-family residential development. Dwelling units approved pursuant to the following exemptions shall not be counted against the established maximum annual development allocation.

(1) Income-restricted housing needed to meet the quantified objectives for very low and low income housing set forth in the Housing Element, along with "density bonus" dwelling units approved pursuant to the provisions of the Housing Element and the City's Density Bonus ordinance.

(2) Dwelling units designed for one or more Special Needs Groups, as defined in the Housing Element (i.e., handicapped, income-restricted senior housing), pursuant to programs set forth in the Housing Element as needed to meet the Housing Element's quantified objectives for housing of special needs groups.

(3) Dwelling units within development projects having vested rights through a valid (unexpired) development agreement or vesting map.

(4) Construction of a single dwelling unit by or for the owner of the lot of record on which the dwelling unit is to be constructed.

(5) Construction of a second dwelling unit on a lot of record.

(6) Development of a project of four or fewer dwelling units.

(7) Development projects within the Rivertown Focused Planning Area.

Antioch General Plan Housing Element

1.1 Ensure the supply of safe, decent and sound housing for all residents.

2.1 Provide adequate residential sites for the production of new for-sale and rental residential units for existing and future residents.

2.2 Facilitate the development of new housing for all economic segments of the community, including lower income, moderate-, and above moderate-income households.

2.3 Actively pursue and support the use of available County, State, and Federal housing assistance programs.

2.4 Proactively assist and cooperate with nonprofit, private, and public entities to maximize opportunities to develop affordable housing. One of the objectives of the updated Land Use Element is to distribute low and moderate income housing throughout the City, rather than concentrate it in one portion of the community. For example, the element allows for higher density housing within the Focus Areas to facilitate affordable housing development.

3.1 Assure the provision of housing opportunities for those residents of the City who have special housing needs, including farm workers, the elderly, disabled, large families, and the homeless.

4.1 Provide incentives for energy conservation measures in new housing by providing information on programs available through PG&E.

5.1 Review and modify standards and application processes to ensure that City standards do not act to constrain the production of affordable housing units.

6.1 Encourage and support the enforcement of laws and regulations prohibiting discrimination in lending practices and in the sale or rental of housing.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact on land use and population if the Plan would:

Land Use

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;

Population and Housing

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);

- Displace substantial numbers of existing housing, population, or jobs, necessitating the construction of replacement housing or relocation of services elsewhere;

No important farmland was identified within the Planning Area, so no impact analysis was conducted for important farmland conversion to urban uses. Therefore, the significance criterion related to farmland is neither included here nor evaluated further in this EIR.

METHODOLOGY AND ASSUMPTIONS

This analysis considers current policies and goals for the City's General Plan, existing and proposed land use conditions within the Planning Area, and applicable regulations and guidelines. The impact analysis uses development projections based on the proposed Specific Plan's configuration of land use classifications, and the gross acreage and assumed density and intensity of each land use classification.

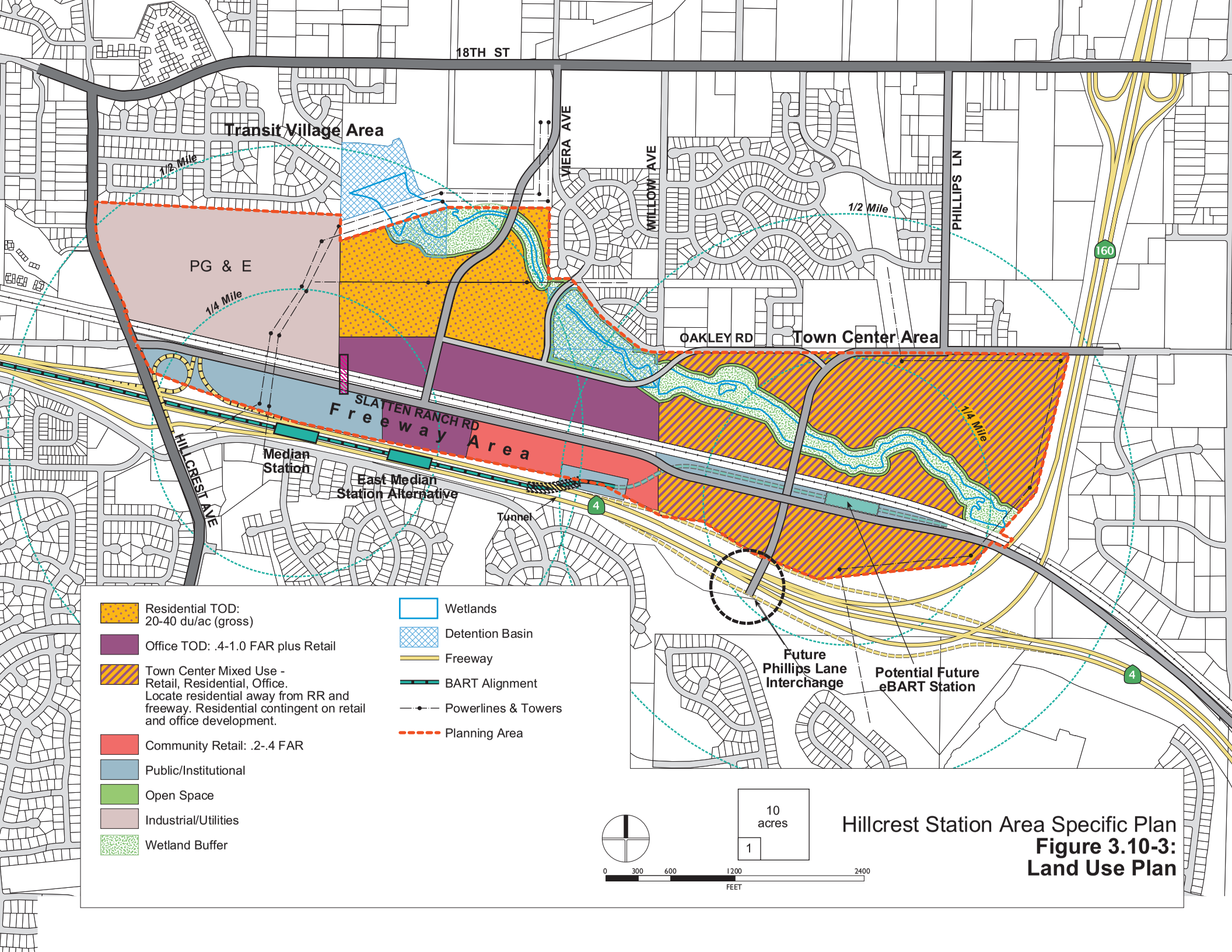
SUMMARY OF IMPACTS

The proposed Hillcrest Station Area Specific Plan will not divide an established community, since the area contains primarily vacant land, and is already bordered on two sides by existing freeways which act as barriers. In fact, implementation of the Specific Plan will create street connections, thereby better connecting the area's existing residents and employees with jobs, services, parks, and transit. Therefore, this criterion is not evaluated further in this section.

The proposed project includes the adoption of the Hillcrest Station Area Specific Plan, plus the subsequent actions needed to implement the Plan and make it consistent with existing plans and regulations. The subsequent actions will include amending the General Plan, Zoning Ordinance and Map, and the Redevelopment Plan for Project Area 3. Therefore, the proposed changes in local land use and policies result in a less than significant impact. The Specific Plan is consistent with MTC Resolution 3434 and the BART Expansion Policy.

Because the Planning Area currently contains very little development, the proposed Specific Plan supports a range of new housing development and new population, but will not result in the displacement of a substantial numbers of people or existing housing. While a few homes and businesses will be displaced with Plan implementation, this process is guided by existing state law and the potential impacts to population and housing are considered less than significant.

The Planning Area is within the boundaries of the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCC HCP). But because the City of Antioch is not a signatory to the ECCC HCP, the project sponsor is not required to participate in this Plan. However, the Specific Plan policies and mitigation measures included in this EIR are as stringent as, and in many cases equivalent to, the Conditions and Conservation Measures described in the ECCC HCP. Therefore, the proposed Plan will not conflict with provisions provided in this or any other HCP.



Hillcrest Station Area Specific Plan

Figure 3.10-3: Land Use Plan

IMPACTS AND MITIGATION MEASURES

3.10-1 *The Plan proposes new policies and land use designations for areas covered by local and regional land use plans. (Less than Significant)*

The project includes the adoption of the Hillcrest Station Area Specific Plan, as well as the subsequent actions needed to implement the Plan and make it consistent with existing plans and regulations. The City will adopt an amendment to the Antioch General Plan concurrently with adoption of the proposed Plan. The General Plan amendment replaces references to the SR 4 Industrial Frontage Focus Area with the policies of the Hillcrest Station Area Specific Plan, defines new land use designations, and updates other General Plan elements with specific implementation policies. Plan implementation will also include, but is not limited to, such tasks as amending the City of Antioch Zoning Ordinance and Map, updating the City's Capital Improvements Program (CIP), and establishing development impact fees.

The proposed Plan forms a land use and regulatory framework that allows up to 2,500 residential units and 2.5 million square feet of commercial development. The following land use classifications will be added to or revised in the General Plan:

- Residential TOD
- Town Center Mixed Use
- Office TOD
- Community Retail
- Parks/Open Space
- Public/Institutional
- Industrial/Utilities

The new land use designations have the following minimum and maximum density and intensity (Floor Area Ratio [FAR]) regulations, as shown in Table 3.10-6.

Table 3.10-6 Development Density Standards

	FAR	*Residential Density*		
Land Use	*Maximum*	*Minimum*	*Maximum*	*Other Density Provisions*
Residential TOD	N/A	20	40	Up to 100 sf commercial space permitted per residential unit. (Includes retail, restaurant, office, and personal services)
Office TOD	1.0	N/A	N/A	Up to 2.5 FAR possible on individual sites.
Town Center Mixed Use	1.0 *	6	25	• Up to 2.5 FAR possible on individual sites. • Up to 50 units per acre possible on individual sites.
Community Retail	0.3	N/A	N/A	

* The maximum FAR is calculated over the entire Town Center Master Plan area and includes the floor area of all uses including residential and hotel.

Source: Dyett & Bhatia, 2008.

Table 3.10-7 illustrates how the number of projected housing units in the eBART corridor meets MTC's Resolution 3434 requirements. The 10,526 units exceed the minimum 6,600 units required.

Table 3.10-7 Existing and Planned Corridor Housing

	Existing	*Planned* [1]	*Total*
Pittsburg/Bay Point	1,873	1,595	3,468
Railroad Ave	1,600	1,590	3,190
Hillcrest	999	1,000	1,999
Subtotal	**4,472**	**4,185**	**8,657**
Phillips Station	369	1,500	1,869
Total	**4,841**	**5,685**	**10,526**

1. Planned housing units assumes that the City of Pittsburg adopts the Railroad Avenue Specific Plan without major changes in housing density requirements.

Source: ABAG Projections 2005; Pittsburg/Bay Point Specific Plan, 1997; Draft Railroad Avenue Specific Plan, 2008.

BART anticipates meeting its ridership threshold requirements by 2030. As a "terminal" station, the Hillcrest Station is projected to serve many commuters from East Contra Costa County. Generally, potential ridership is calculated based on 0.6 riders per household and 0.1 riders per job within one-half mile radius of the station. By this calculation, the Planning Area developed as the proposed Plan would generate at least 2,065 riders. In addition, BART estimates that there will be 0.1 riders per household in all of East Contra Costa County. The proposed Plan includes policies supporting 2,600 parking spaces to be built near the eBART stations to serve demand from East County riders. BART estimates that the Hillcrest Station(s) will serve approximately 8,200 daily riders. The City of Pittsburg Railroad Avenue Station will serve about 1,900 riders, for a total of 10,100 riders on the eBART line.

Mitigation Measures

No mitigation measures are required.

3.10-2 *The proposed Plan induces increased population and jobs through the development of new housing and commercial uses. (Less than Significant)*

The proposed Specific Plan allows construction of new residential and commercial development which will result in a substantial increase in population and jobs. However, the proposed Specific Plan does not contribute to substantial unanticipated increases in population or jobs beyond those currently projected by ABAG. It is assumed in the traffic analysis (Section 3.4) that the total development in East Contra Costa County will not change as a result of the Hillcrest Station Area Specific Plan; only the location of the anticipated development will be shifted from other potential development sites to the Planning Area during the planning horizon.

As indicated in Table 3.10-2, Antioch's population is projected to grow by 26,900 residents (27 percent increase) and the number of jobs is projected to grow by 20,290 (99 percent increase) between 2005 and 2035. The total projected growth for the Planning Area is 5,000 residents and 5,600 jobs, which is approximately 19 percent of the City's population growth and 27 percent of

the City's employment growth during the planning period. Therefore, cumulatively, this is a less than significant impact.

The proposed Plan supports approximately 2,500 residential units and 2.5 million square feet of commercial development. The buildout population is anticipated to be approximately 5,000 residents, which is about 19 percent of ABAG projected growth between 2005 and 2035. The majority of the housing will be in multi-unit structures, and some portion will be in mixed-use buildings. Based on the residential densities of the land uses in the Station Area, no single-family homes are assumed. Multi-family households are assumed to have 2.0 persons each. This assumption is based on Antioch 2000 US Census block data showing an average multi-family household size of 2.42 persons per unit; and the average household size around the Concord, Pleasant Hill, and Walnut Creek BART Stations which is 1.57 persons per unit.

Table 3.10-8 Buildout Projections: Housing Units and Population (2035)

	Households	*Population*
Transit Village Area	1,000	2,000
Town Center Area	1,500	3,000
Total	**2,500**	**5,000**

Source: Dyett & Bhatia, 2008.

ABAG projections estimate that the City of Antioch will build about 10,510 new housing units between 2005 and 2035. The proposed Plan assumes that the Planning Area will capture about 24 percent of the anticipated housing market.

The land uses in the Proposed Plan Diagram are expected to support approximately 5,600 new jobs at buildout. This would be approximately 28 percent of the employment growth anticipated in ABAG's projections.

Table 3.10-9 Buildout Commercial Square Footage and Jobs (2035)

	Office SF	*Retail SF*	*Hotel Rooms*	*Jobs*
TOD West	780,000	225,000	-	2,600
TOD East	420,000	775,000	325	3,000
Total	**1,200,000**	**1,000,000**	**325**	**5,600**

Estimated employment at buildout was calculated using the following assumptions:

- Retail employment is assumed to generate one job for every 500 square feet of gross floor area, based on total gross acres of land.
- Office employment is assumed to generate one job for every 350 square feet of gross floor area, based on total gross acres of land.
- Hotel employees are estimate at a rate of 0.8 employees per room.

Source: Dyett & Bhatia, 2008.

Mitigation Measures

No mitigation measures are required.

3.11 Noise

This section discusses the noise impacts associated with the implementation of the proposed Specific Plan. It covers both construction impacts and long-term operational impacts of the Plan. The section also provides background information to help understand noise and its impacts, the regulation of noise by different agencies, and a description of the existing noise environment in the Planning Area.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

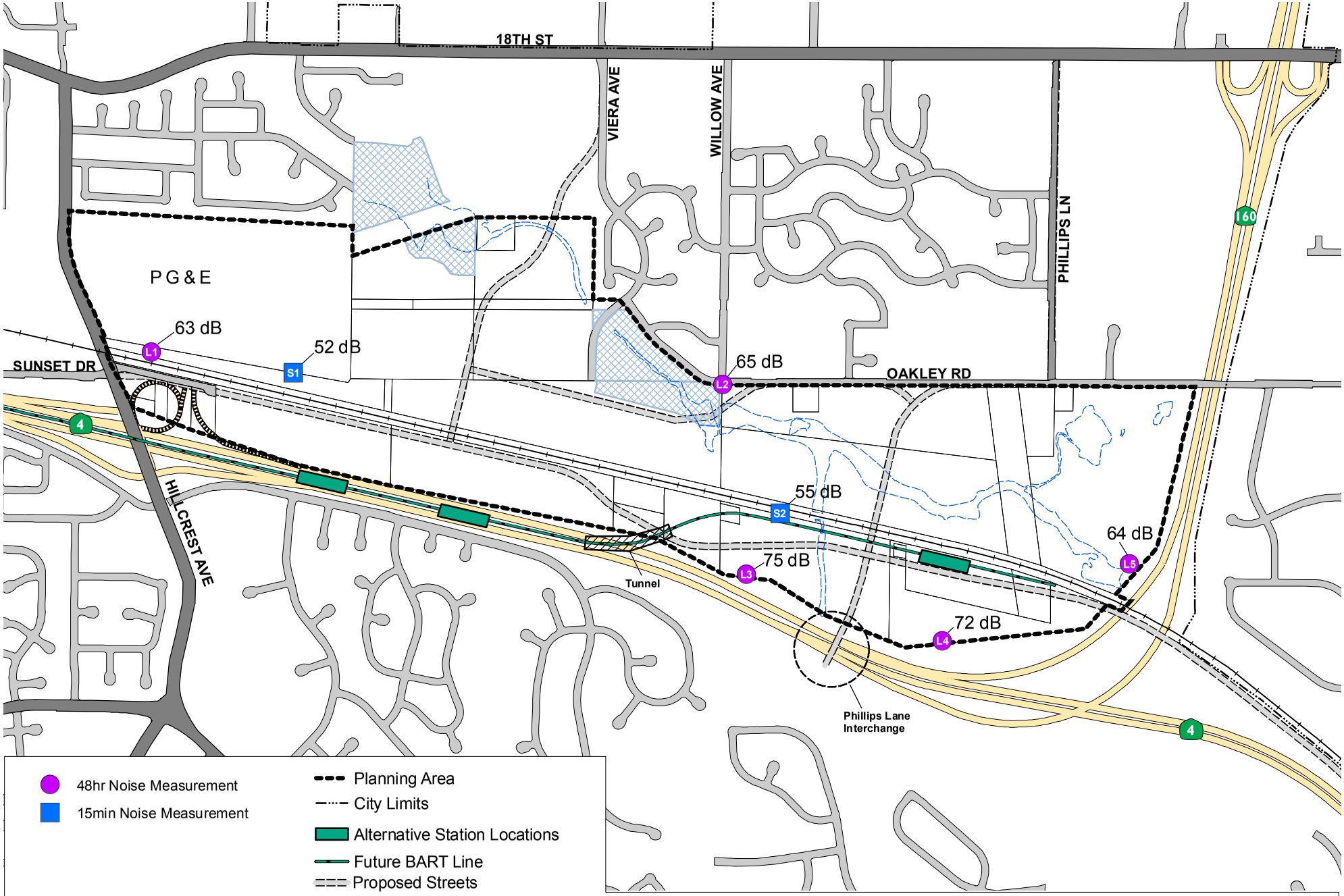
Noise

As in most urban areas, vehicular traffic along major arterials is the principal noise source in the Planning Area. The dominant and consistent source of noise near the Planning Area is on-road vehicle traffic, particularly SR 4 and SR 160. Vehicular traffic along Hillcrest Avenue and Oakley Road contribute to the noise environment to a lesser degree. The Union Pacific Mococo Railroad right-of-way traverses the Planning Area on an east-west axis. At this time very few trains use this right-of-way, so railway noise is not a persistent factor. A transformer fan at the PG&E substation also contributes to the existing noise environment. Other potential human-caused sources of noise include planes flying overhead, construction, and landscaping equipment.

The level of highway traffic noise depends on three factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Changes in traffic volume do not have a major influence on traffic noise levels. The primary source of noise from automobiles is high frequency tire noise, which increases with speed. In addition, trucks and older automobiles produce engine and exhaust noise, and trucks also generate wind noise. While tire noise from autos is generally located at ground level, truck noise sources can be located as high as ten to fifteen feet above the roadbed due to tall exhaust stacks and higher engines; sound walls are not effective for mitigating such noise unless they are very tall. Other factors that affect the perception of traffic noise include: distance from the highway, terrain, vegetation, and natural and structural obstacles.

Noise Measurements

To quantify the existing noise environment at the project site, five continuous two-day (L1 through L5) noise measurements and two 15-minute short-term (S1 and S2) measurements were conducted from October 8 to 10, 2008. The short-term monitors measured noise levels simultaneously with synchronized long-term monitors and were used to estimate the Community Noise Equivalent Level (CNEL) at the short-term measurement locations. Table 3.11-1 and Figure 3.11-1 shows a summary of the measured data. CNEL describes a 24 hour average cumulative noise level measurement.



Hillcrest Station Area Specific Plan

Figure 3.11-1: Existing Noise Measurements

Source: Salter, 2008; BART, 2008; Contra Costa County, 2004; City of Antioch, 2007; Dyett & Bhatia, 2008.

Table 3.11-1 Existing Noise Measurements

Monitor	*Location*	*Primary Noise Source(s)*	*Measured CNEL*
L1	Approximately 385-feet east of the Hillcrest Avenue centerline, 215 feet north of the Sunset Drive centerline, six-feet above grade.	Hillcrest Avenue and bus stop directly to the south	**63 dB**
L2	Approximately 40-feet south of the Oakley Road centerline at the Willow Avenue intersection, 12-feet above grade.	Distant SR 4 and Oakley Road	**65 dB**
L3	Approximately 185-feet north of the SR 4 centerline on hill, 3150 feet west of the centerline of the SR 160 bridges over the rail line, 90-degree line-of-sight to SR 4, six-feet above grade.	SR 4	**75 dB**
L4	Approximately 300-feet north of SR 4 centerline at top of hill, 1730-feet west of the centerline of the SR 160 bridges over the rail line, 120-degree line-of-sight to SR 4, six-feet above grade.	SR 4	**72 dB**
L5	Approximately 330-feet west of SR 4 centerline, 195-feet north of freight line, 12-feet above grade	SR 160	**64 dB**
S1	Approximately 820-feet north of SR 4 centerline, 1450-east of Hillcrest Avenue, 5-feet above grade.	SR 4	52 dB [1]
S2	Approximately 75-feet south of freight line, 550-feet east of Willow Avenue, 725-feet north of SR 4 centerline, behind hill, 5-feet above grade.	Distant SR 4 and Oakley Road	55 dB [2]

Note: Measurements exceeding the existing City standards for noise are in **bold**.

1. Calculated from a 15-minute L_{eq} offset from monitor L1
2. Calculated from a 15-minute L_{eq} offset from monitor L3

Source: Charles M Salter Associates Inc, 2008

Vibration

Typically, indoor vibration levels near traffic corridors are below the threshold of human perception (below 65 VdB). In some instances, poorly maintained, rough roads with heavy-duty vehicles may generate perceptible vibrations; however, perceptible vibration levels would more likely be generated from construction equipment during project construction and transit vehicles after construction is complete. At this time, there are no major sources of vibrations in the Planning Area. Freight train activity is very infrequent, so no vibration velocity measurements were taken.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others. People in residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks, and outdoor recreation areas are generally more sensitive to noise than are people at commercial and industrial establishments. Consequently, the noise standards for sensitive land uses are more stringent than for those at less sensitive uses. At this time, there are no sensitive receptors within the Planning Area; however, much of the area is surrounded by

existing residential uses. Additionally, a church is located adjacent to the Planning Area at Oakley Road near the SR 160 overcrossing.

TECHNICAL BACKGROUND

Noise is commonly defined as undesirable or unwanted sound. Noises vary widely in their scope, source, and volume, ranging from individual occurrences such as leaf blowers, to the intermittent disturbances of overhead aircraft, to the fairly constant noise generated by traffic on freeways. Noise can have real effects on human health, including hearing loss and the psychological effects or irritability from lack of sleep. Noise is primarily a concern with regard to noise-sensitive uses such as residences, schools, churches, and hospitals.

Noise

Measuring Sound

Sound is generated by sound waves traveling outward from a source; the sound waves exert a sound pressure level (commonly called "sound level"), measured in decibels (dB). In general, people can perceive a two- to three-dB difference in noise levels; a difference of 10 dB is perceived as a doubling (or halving) of loudness. Environmental noise is usually measured in A-weighted decibels; a metric corrected for the variation in frequency response of the human ear. The A-weighted scale is used to describe all noise levels (dB) discussed in this section.

Three aspects of community noise are used in assessing the noise environment:

- **Level** (e.g., magnitude or loudness) of sound. Sound levels are measured and expressed in decibels (dB) with 10 dB roughly equal to the threshold of hearing.
- **Frequency** composition or spectrum of the sound. Frequency is a measure of the pressure fluctuations per second, measured in units of hertz (Hz). The characterization of sound level magnitude with respect to frequency is the sound spectrum, often described in octave bands, which divide the audible human frequency range (e.g., from 20 to 20,000 Hz) into ten segments.
- **Variation** in sound level with time, measured as noise exposure. Most community noise is produced by many distant noise sources that change gradually throughout the day and produce a relatively steady background noise having no identifiable source. Identifiable events of brief duration, such as aircraft flyovers, cause the community noise level to vary from instant to instant.

Reporting Noise Levels

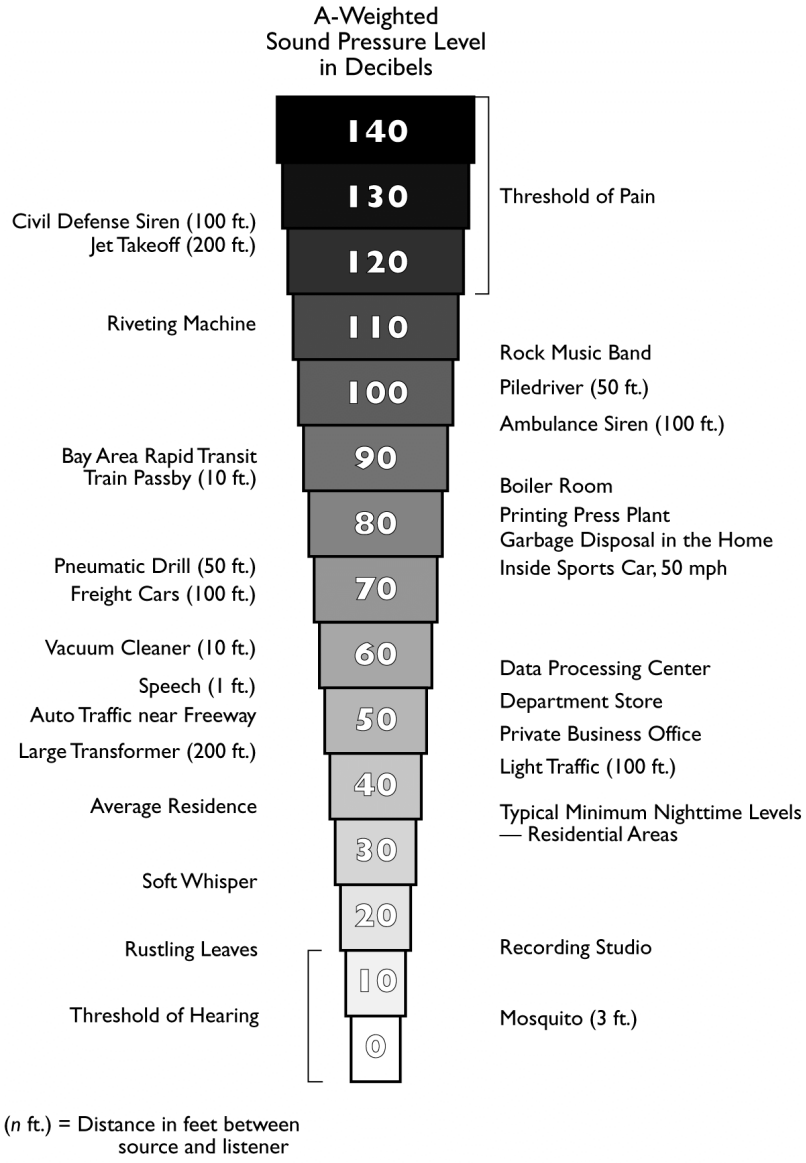
The noise levels presented in Figure 3.11-2 are representative of measured noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. Rather, noise levels vary with time, such that the noise experienced in any one place, or the community noise environment, varies continuously over time. Specifically, community noise is the result of many distant noise sources that constitute a relatively stable background noise exposure where the individual contributors are unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic. At the same time, throughout the day, short duration single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) that are readily identifiable to the individual

add to the existing background noise level. The combination of the slowly changing background noise and the single-event noise events give rise to a constantly changing community noise environment.

Given the variation of community noise levels from instant to instant, community noise levels must be measured over an extended period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

- L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- L_{max}: The instantaneous maximum noise level measured during the measurement period of interest.
- L_x: The sound level that is equaled or exceeded x percent of a specified time period. The L_{50} represents the median sound level (i.e., the noise level exceeded 50 percent of the time).
- DNL: The day-night average sound level (DNL) is the energy average of the A-weighted sound levels occurring during a 24-hour period, accounting for the greater sensitivity of most people to nighttime noise by weighting ("penalizing") nighttime noise levels by adding 10 dBA to noise between 10:00 p.m. and 7:00 a.m.
- CNEL: Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m., in addition to the 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

FIGURE 3.11-2: Typical Sound Levels



Effects of Noise on People

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

- subjective effects of annoyance, nuisance, 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 generally 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 exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Therefore, an important way of predicting human reaction to a new or changed noise environment is the way the noise levels compare 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 an approximate doubling in loudness, and can cause an adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary "point" sources of noise, including stationary mobile sources such as idling vehicles, attenuate (decrease) at a rate of 6 dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (i.e., atmospheric conditions and noise barriers). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles (a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA per doubling of the distance from the source, again, depending upon environmental conditions (Caltrans, 1998). Noise from large construction sites would have characteristics of both "point" and "line" sources, so attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance.

Noise levels may also be reduced by intervening structures. For example, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA. Structures also act to insulate people inside these structures from exterior noise. Older home construction methods generally provide a reduction of exterior-to-interior noise levels of about 20 dBA with closed windows, while the reduction in newer homes is generally 30 dBA or more.

Vibration

In contrast to airborne noise, ground-borne vibration is less common as an environmental problem. All structures can be made to vibrate with the application of an external force. An external force common to occupied buildings can either be continuously operating "steady-state" (e.g., rotating machinery), or a short duration occurrence "transient" (e.g., ground-borne motion due to traffic and rail operations, or structure-borne motion due to human activity inside the building such as footfalls). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly and sick), and vibration sensitive equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal in inches per second (in/sec). The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the affect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.

The effects of ground-borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. Examples of vibration inducing elements are jackhammers, pile drivers, and blasting. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 in/sec PPV and the FTA threshold of human annoyance to ground-borne vibration is 80 VdB RMS. (Federal Transit Administration, 2006)

Table 3.11-2: Typical Levels of Groundborne Vibrations

Human/Structural Response	*Velocity Level (VdB)*	*Typical Events (50 foot setback)*
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment
	95	Heavy tracked vehicles (bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading television subtitles or computer screen	90	
	85	Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, frequent events	75	Commuter rail, typical
		Bus or truck over bump on rough roads
	70	Rapid transit, typical
Approximate human threshold of perception to vibration	65	Buses, trucks, and heavy street traffic
	60	
	55	Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	

Source: Federal Transit Administration, 2006

If the external force is removed, the structure will still continue to vibrate freely until all vibratory energy is dissipated. Energy dissipation, sometimes referred to as damping, occurs because of friction in a material or at the interface between two materials. Energy loss at the interface between two materials is sometimes referred to as a "coupling loss." Vibratory energy is transferred from a material to its surrounding environment in the form of heat, sound, etc. Adding damping to a structure reduces vibration levels. However, it is generally not practical. Other more practical methods of reducing vibration levels in a structure have been successful in projects near extreme vibration sources, such as: reinforcing the building's resistance to vibrations by reducing beam, girder, and joist spans; using isolating systems likes springs or pads; or digging a deep trench between the project and the source.

REGULATORY SETTING

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources associated with industrial, commercial and construction activities is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

Definitions

Day-Night Average Sound Level (DNL)

A descriptor established by the U.S. Environmental Protection Agency to represent a 24-hour average sound level with a 10 dB penalty applied to noise occurring during the night-time hours (10 p.m. – 7 a.m.) to account for the increased sensitivity of people during sleeping hours. A 10-dB increase in sound level is perceived by people to be twice as loud.

Community Noise Equivalent Level (CNEL)

A descriptor for the 24-hour A-weighted average noise level. The CNEL concept accounts for the increased acoustical sensitivity of people to noise during the evening and night-time hours. Sound levels during the hours from 7 p.m. to 10 p.m. are penalized 5 dB; sound levels during the hours from 10 p.m. to 7 a.m. are penalized 10 dB. The CNEL value can be considered approximately equal to the DNL value, as the difference between the two is often less than 1 dB.

Federal Regulations

Code of Federal Regulations. Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck passby noise standard is 80 dB at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

Federal regulations for railroad noise are contained in 40 CFR [Code of Federal Regulations], Part 201 and 49 CFR, Part 210. Noise limits for locomotives manufactured during or after 1980 are as follows: stationary locomotives (at idle throttle setting) are not to exceed 70 dB at 15 meters (approximately 50 feet) from the track pathway centerline. Stationary locomotives (at all other throttle settings) are not to exceed 87 dB at 15 meters; and moving locomotives are not to exceed 90 dB at 15 meters. These noise limits are implemented through regulatory controls on locomotive manufacturers.

Federal Highway Administration. In addition to noise standards for individual vehicles, under regulations established by the U.S. Department of Transportation's Federal Highway Administration, noise abatement must be considered for certain federal or federally-funded projects. Abatement is an issue for new highways or significant modification of an existing freeway. The agency must determine if the project would create a substantial increase in noise or if the predicted noise levels approach or exceed the Noise Abatement Criteria. Under the regulations, a substantial increase is defined as an increase in L_{eq} 12 dB during the peak hour of traffic noise. The Noise Abatement Criteria differ among various activity categories. For sensitive uses, such as residences, schools, churches, parks, and playgrounds, the Noise Abatement Criteria is L_{eq} 57 (interior) and 67 dB (exterior) during the peak hour of traffic noise.

Swift Rail Development Act. The sounding of locomotive horns or whistles in advance of highway rail grade crossings has been used as a safety precaution by railroads since the late 1880s. The manner in which horns have been sounded (two longs, one short and one long) was standardized in 1938. In response to a growing national trend towards restrictions on the use of locomotive horns under local ordinances and a related increase in collisions, Congress passed the Swift Rail Development Act, which directs the Federal Railroad Administration (FRA) to develop rules addressing this issue. In January 2000, the FRA published a proposed rule requiring use of the horns or whistles on approaches to every public road / rail grade crossing. An exception is

made in approved quiet zones, where supplementary safety measures have been installed or adopted by the state or locality. The proposed rule would also establish an upper limit for the loudness of train horns. Quiet zones are adopted by local governments, and approved by the FRA.

National Environmental Policy Act. The National Environmental Policy Act (NEPA), signed into law on January 1, 1970, directs federal agencies to carry out their regulations, policies and programs in accordance with NEPA's environmental protection policies. Although NEPA does not establish specific noise standards, the noise impacts of projects are routinely considered as one of the potential environmental consequences of federal actions subject to NEPA (such as certain federally funded highway or rail projects).

Federal Transit Administration Vibration Guidelines. Light and heavy rail are potential sources of substantial ground vibration depending on distance, the type and speed of trains, and the type of track. The Federal Transit Administration (FTA) of the U.S Department of Transportation has developed vibration impact assessment criteria for evaluating vibration impacts associated with rapid transit projects. The FTA vibration standards for residences and buildings where people normally sleep are listed in Table 3.11-3.

Table 3.11-3: FTA Groundborne Vibration Criteria (VdB)

	Groundborne Vibration Impact Limits		
Receiving Land Use Category	*Infrequent Events* [a]	*Occasional Events* [b]	*Frequent Events* [c]
Category 1 – Buildings where low ambient vibration is essential for interior operations	65 [d]	65 [d]	65 [d]
Category 2 – Residences and buildings where people normally sleep	80	75	72
Category 3 – Institutional land uses with primary daytime use	83	78	75

a. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.

b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

c. "Frequent Events" is defined as more than 70 vibration events of the same source per day.

d. This limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research should always require detailed evaluation to define the acceptable vibration limits. Ensuring low vibration levels in a building requires special design of HVAC systems and stiffened floors.

Source: Federal Transit Administration, May 2006.

The FTA provides critical screening distances for vibration impacts on high-sensitivity, residential, and institutional land uses, as summarized in Table 3.11-4. The FTA methodology assumes that buildings beyond the screening distance would not be subject to vibration levels that exceed acceptable levels. Within the screening distance, vibration levels may be a potential impact that should be further analyzed and disclosure should be made to purchasers/lessees. However, these distances are guidelines, not standards.

Table 3.11-4 Critical Screening Distances for Freight Rail Vibration

Use	*Feet*
High-Sensitivity Uses [1]	600
Residential	200
Institutional	120

1. High-sensitivity uses include facilities such as vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations.

Source: Federal Transit Administration, May 2006

Vibration levels generated by railway operations are dependent on site specific conditions, such as rail condition, terrain, and soil strata. Vibration measurement data for similar projects in the Bay Area (e.g., Hercules, Livermore, Hayward) indicate that train vibration levels meet the FTA residential and institutional goals within approximately 80 feet to 120 feet of railways.

State Regulations

California Department of Transportation. The State establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State passby standard is consistent with the federal limit of 80 dB. The State passby standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dB at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by state and local laws enforced against vehicle operators. For new roadway projects, the California Department of Transportation (Caltrans) employs the Noise Abatement Criteria, discussed above in connection with the Federal Highway Administration.

California Code of Regulations, California Building Code. The State has established noise insulation standards for new multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards. The noise insulation standards set forth an interior standard of DNL 45 dB for any habitable room. They also require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than DNL 60 dB. If windows must be in the closed position to meet the interior noise level standard, the project design must include a ventilation or air-conditioning system to provide fresh air to the habitable interior environment. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

Regional and Local Regulations

Antioch Municipal Code

5-17.04 Heavy Construction Equipment Noise

(A) For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

Heavy Construction Equipment. Equipment used in grading and earth moving, including diesel engine equipped machines used for that purpose, except pickup trucks of one ton or less.

Operate. Includes the starting, warming-up, and idling of heavy construction equipment engines or motors

(B) It shall be unlawful for any person to operate heavy construction equipment during the hours specified below:

(1) On weekdays prior to 7:00 a.m. and after 6:00 p.m.

(2) On weekdays within 300 feet of occupied dwelling space, prior to 8:00 a.m. and after 5:00 p.m.

(3) On weekends and holidays, prior to 9:00 a.m. and after 5:00 p.m., irrespective of the distance from the occupied dwelling.

5-17.05 Construction Activity Noise

(A) As used in this section, "***construction activity***" means the process or manner of constructing, building, refurbishing, remodeling or demolishing a structure, delivering supplies thereto and includes, but is not limited to, hammering, sawing, drilling, and other construction activities when the noise or sound there from can be heard beyond the perimeter of the parcel where such work is being performed. The term "construction activity" also includes the testing of any audible device such as a burglar or fire alarm or loudspeaker. "Construction activity" does not include floor covering installation or painting when done with non-powered equipment.

(B) It shall be unlawful for any person to be involved in construction activity during the hours specified below:

(1) On weekdays prior to 7:00 a.m. and after 6:00 p.m.

(2) On weekdays within 300 feet of occupied dwellings, prior to 8:00 a.m. and after 5:00 p.m.

(3) On weekends and holidays, prior to 9:00 a.m. and after 5:00 p.m., irrespective of the distance from the occupied dwellings.

(C) In addition to the penalties provided by this code, authorized employees may issue "Stop Work Orders" when a violation of this section or Section 5-17.04 has occurred. If such a Stop Work Order is issued, it shall not be released until the holder of the building permit provides assurance that future violations will not occur.

Section 9-5.19 contains the noise attenuation requirements for stationary and mobile noise sources.

9-5.1901(A) Stationary noise sources. Uses adjacent to outdoor living areas (e.g., backyards for single-family homes and patios for multi-family units) and parks shall not cause an increase in background ambient noise which will exceed 60 CNEL. *[Note: CNEL is approximately equivalent to DNL; typically there is less than 1 dB difference between the two.]*

9-5.1901(B) Mobile noise sources.

(1) Arterial and street traffic shall not cause an increase in background ambient noise which will exceed 60 CNEL.

(2) Proposed outdoor residential living areas adjacent to the future expressway (State Route 4 Bypass) or to State Route 4, including BART or eBART development, may be allowed up to a maximum of 65 CNEL as approved by the city.

(3) Existing outdoor residential living areas adjacent to the State Route 4 proposed widening, or to BART or eBART development, shall result in no significant increase (CNEL 5 dB or greater) in existing noise levels.

9-5.1901(C) Noise analysis. For new developments adjacent to the future bypass, applicants may be required to provide a noise and/or visual analysis conducted pursuant to the city's development and environmental review process as determined by staff during the project planning/entitlement phase.

9-5.1901(D) Noise attenuation. The city may require noise attenuation measures be incorporated into a project to obtain compliance with this section. Measures outlined in the noise policies of the General Plan should be utilized to mitigate noise to the maximum feasible extent.

9-5.1901(E) Flexible application. The city may allow up to 65 CNEL for residential projects adjacent to the future bypass or to State Route 4, BART or eBART if the applicant has demonstrated that noise attenuation down to 60 CNEL would result in significantly higher walls.

Antioch General Plan

11.6.1 Noise Objective

Achieve and maintain exterior noise levels appropriate to planned land uses throughout Antioch, as described below.

- Residential
  - Single Family: 60 dBA CNEL within rear yards
  - Multi-Family: 60 dBA CNEL within interior open space
- Schools
  - Classrooms: 65 dBA CNEL
  - Play and sports areas: 70 dBA CNEL
- Hospitals, Libraries: 60 dBA CNEL
- Commercial/Industrial: 70 dBA CNEL at the front setback.

11.6.2 Noise Policies: Noise Compatible Land Use and Circulation Patterns

a. Implementation of the noise objective contained in Section 11.6.1 and the policies contained in Section 11.6.2 of the Environmental Hazards Element shall be based on noise data contained in Section 4.9 of the General Plan EIR, unless a noise analysis conducted pursuant to the City's development and environmental review process provides more up-to-date and accurate noise projections, as determined by the City.

b. Maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources to the extent possible, and guide noise-tolerant land uses into the noisier portions of the Planning Area.

c. Minimize motor vehicle noise in residential areas through proper route location and sensitive roadway design.

- Provide planned industrial areas with truck access routes separated from residential areas to the maximum feasible extent.
- Where needed, provide traffic calming devices to slow traffic speed within residential neighborhoods.

d. Where new development (including construction and improvement of roadways) is proposed in areas exceeding the noise levels identified in the General Plan Noise Objective, or where the development of proposed uses could result in a significant increase in noise, require a detailed noise attenuation study to be prepared by a qualified acoustical engineer to determine appropriate mitigation and ways to incorporate such mitigation into project design and implementation.

e. When new development incorporating a potentially significant noise generator is proposed, require noise analyses to be prepared by a qualified acoustical engineer. Require the implementation of appropriate noise mitigation when the proposed project will cause new exceedences of General Plan noise objectives, or an audible (3 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development.

f. In reviewing noise impacts, utilize site design and architectural design features to the extent feasible to mitigate impacts on residential neighborhoods and other uses that are sensitive to noise. In addition to sound barriers, design techniques to mitigate noise impacts may include, but are not limited to:

- Increased building setbacks to increase the distance between the noise source and sensitive receptor.
- Orient buildings which are compatible with higher noise levels adjacent to noise generators or in clusters to shield more noise sensitive areas and uses.
- Orient delivery, loading docks, and outdoor work areas away from noise-sensitive uses.
- Place noise tolerant use, such as parking areas, and noise tolerant structures, such as garages, between the noise source and sensitive receptor.
- Cluster office, commercial, or multifamily residential structures to reduce noise levels within interior open space areas.
- Provide double glazed and double paned windows on the side of the structure facing a major noise source, and place entries away from the noise source to the extent possible.

g. Where feasible, require the use of noise barriers (walls, berms, or a combination thereof) to reduce significant noise impacts.

- Noise barriers must have sufficient mass to reduce noise transmission and high enough to shield the receptor from the noise source.
- To be effective, the barrier needs to be constructed without cracks or openings.
- The barrier must interrupt the line of sight between the noise source and noise receptor.

- The effects of noise "flanking" the noise barrier should be minimized by bending the end of the barrier back from the noise source.
- Require appropriate landscaping treatment to be provided in conjunction with noise barriers to mitigate their potential aesthetic impacts.

h. Continue enforcement of California Noise Insulation Standards (Title 25, Section 1092, California Administrative Code).

Temporary Construction

i. Ensure that construction activities are regulated as to hours of operation in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.

j. Require proposed development adjacent to occupied noise sensitive land uses to implement a construction-related noise mitigation plan. This plan would depict the location of construction equipment storage and maintenance areas, and document methods to be employed to minimize noise impacts on adjacent noise sensitive land uses.

k. Require that all construction equipment utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

m. Prior to the issuance of any grading plans, the City shall condition approval of subdivisions and non-residential development adjacent to any developed/occupied noise-sensitive land uses by requiring applicants to submit a construction-related noise mitigation plan to the City for review and approval. The plan should depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as:

- The construction contractor shall use temporary noise-attenuation fences, where feasible, to reduce construction noise impacts on adjacent noise sensitive land uses.
- During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- The construction contractor shall limit all construction-related activities that would result in high noise levels to between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday. No construction shall be allowed on Sundays and public holidays.

n. The construction-related noise mitigation plan required shall also specify that haul truck deliveries be subject to the same hours specified for construction equipment. Additionally, the plan shall denote any construction traffic haul routes where heavy trucks would exceed 100 daily trips (counting those both to and from the construction site). To the extent feasible, the plan shall denote haul routes that do not pass sensitive land uses or residential dwellings. Lastly, the

construction-related noise mitigation plan shall incorporate any other restrictions imposed by the City.

Local Standard

The adopted City standard is to achieve and maintain exterior noise levels appropriate to planned land uses throughout Antioch.

Table 3.11-5: Maximum Noise by Land Use

Land Use	*Maximum Sound Levels*
Residential Single Family	60 dBA CNEL in rear yards (up to 65 CNEL adjacent to SR 4 or eBART)
Residential Multi-Family	60 dBA CNEL in interior open space (up to 65 CNEL adjacent to SR 4 or eBART)
School Classrooms	65 dBA CNEL
School Play areas	70 dBA CNEL
Hospitals, Libraries	60 dBA CNEL
Commercial/Industrial	70 dBA CNEL at the front setback

Source: City of Antioch General Plan, November 24, 2003.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact on noise if the Plan would:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

METHODOLOGY AND ASSUMPTIONS

Methodology

To quantify the existing noise environment at the project site, five continuous two-day (L1 through L5) noise measurements and two 15-minute short-term (S1 and S2) measurements were conducted from October 8 to 10, 2008. The short-term monitors measured noise levels simultaneously with synchronized long-term monitors and were used to estimate the CNEL at the short-term measurement locations.

This analysis evaluates the aggregate noise effects of the full implementation of the proposed Specific Plan. The future noise contours were created using the CadnaA noise prediction software. This software conforms to ISO Standard 9613, "Attenuation of sound during propagation outdoors." Future development projects may be required to perform additional noise analysis and any noise reduction measures identified in the studies shall be incorporated into the individual projects.

Construction noise impacts due to development pursuant to the Specific Plan have been assessed qualitatively.

Assumptions

The contours for the future noise environment were based on the following assumptions:

- The future road network as described in Section 3.4 is assumed to be completed in 2035. The 2035 road network includes the potential Phillips Lane Interchange. Future traffic data was provided by Fehr & Peers. Vehicular noise propagation is per the Federal Highway Administration.
- The future topography is based on the Roadway Infrastructure Conceptual Grading Plan dated October 16, 2008 by BKF Engineers. This conceptual grading plan is a preliminary plan based on the future road network.
- The eBART project is assumed to be completed and in operation in 2015. The noise analysis includes two eBART stations, one in the SR 4 median and another adjacent to the railroad right of way near the future Phillips Lane interchange. Noise levels from the eBART project are summarized from the eBART Draft Environmental Impact Report dated September 2008. The worst-case scenario for noise includes the maintenance yard outside the SR 4 median, located between SR 4 and the railroad right of way near the center of the Planning Area.
- In absence of more information from Union Pacific, a worst-case scenario of 40 trains running on the Mococo Freight Line is evaluated. Trains are assumed to be evenly spread throughout the day and night. The noise levels are from the Federal Transit Administration methodology (FTA Office of Planning and Environment, May 2006).
- The future noise contours are based on an average temperature of 68°F with 50 percent relative humidity.

SUMMARY OF IMPACTS

Noise

The noise analysis is cumulative in nature. It includes the noise generated by increased regional traffic, train activity, and the eBART project, as well as the projected development within the Planning Area. By 2035, the projected noise environment for some residential and commercial projects planned along SR 4, SR 160, and the Union Pacific Mococo railroad will exceed City noise level standards. Sources of noise in the future include the eBART transit project, bus transit, increased traffic volumes and new roads, and a transformer fan at the PG&E substation. If Union Pacific resumes freight rail service on the Mococo line, increased noise levels will be significant. However, this impact is not a result of proposed Specific Plan projects. Policies proposed under the Specific Plan would reduce the impact of increased noise, but due to resumption of freight rail service will cause a significant and unavoidable impact on future development in the area proposed by the Specific Plan.

The current City standards state that outdoor living areas for residential projects near SR 4, the SR 4 Bypass, and the eBART project may be allowed up to a maximum of 65 CNEL. In 2035, approximately 138 acres of the Planning Area (38 percent) will be within areas with noises levels equal to or greater than 65 dB. The standard for commercial and industrial uses is that the CNEL must be 70 dB or less at the front setback of the building. There will be approximately 50 acres of the Planning Area (13 percent) that exceed this standard. As seen in Figure 3.11-3, these areas are concentrated along SR 4, SR 160, and the railroad. Approximately 616 Residential TOD units and 724 Town Center Mixed Use units will be in areas with noise levels above 65 dB; and approximately 444,000 square feet of community retail and 142,000 square feet of office TOD will be in areas with noise levels above 70 dB.

In residential areas where exterior noise levels would be exceeded, Specific Plan policies require noise mitigations that lower interior noise levels below the City and State minimum standard of 45 dB, to compensate for the high exterior noise levels which make outdoor activities uncomfortable.

Intermittent noise and vibration levels of construction projects within the Planning Area would be temporary but significant depending on the proximity of construction activities to sensitive receptors and the mitigation strategies in place. Compliance with City regulations and the proposed Specific Plan policy would ensure that construction noise and vibration impacts would be less than significant.

Airport Noise

Because the Planning Area is not located in an airport land use plan or within two miles of a public airport or public use airport, there is no impact to consider in this environmental review.

Vibrations

The resumption of freight rail travel on the Union Pacific Mococo Rail Line would cause vibrations which would impact existing and new development in the Hillcrest Station Area. There are no specific Building Code requirements for vibration levels in buildings. However, Specific Plan policies require project-level analysis to be completed to determine feasible vibration mitigation measures for development subject to these vibrations; and require implementation of feasible mitigations. Therefore, this impact is less than significant.

IMPACTS AND MITIGATION MEASURES

3.11-1 *Development pursuant to the proposed Specific Plan could expose persons to or generate noise levels in excess of the City standards. (Significant and Unavoidable)*

Future development within the Planning Area will result in the development of new roads near existing neighborhoods and overall increased traffic volumes, thus increasing noise levels in some areas. In addition, development will occur near a potentially active freight rail line which is a major noise source, particularly within a quarter mile of where the horn sounds for at-grade road crossings like Hillcrest Avenue. Other sources of noise in the future will be the eBART transit project with a 24-hour maintenance yard, bus transit, and a transformer fan at the PG&E substation. The projected noise environment is summarized in Table 3.11-6. Projected future noise contours are illustrated in Figure 3.11-3.

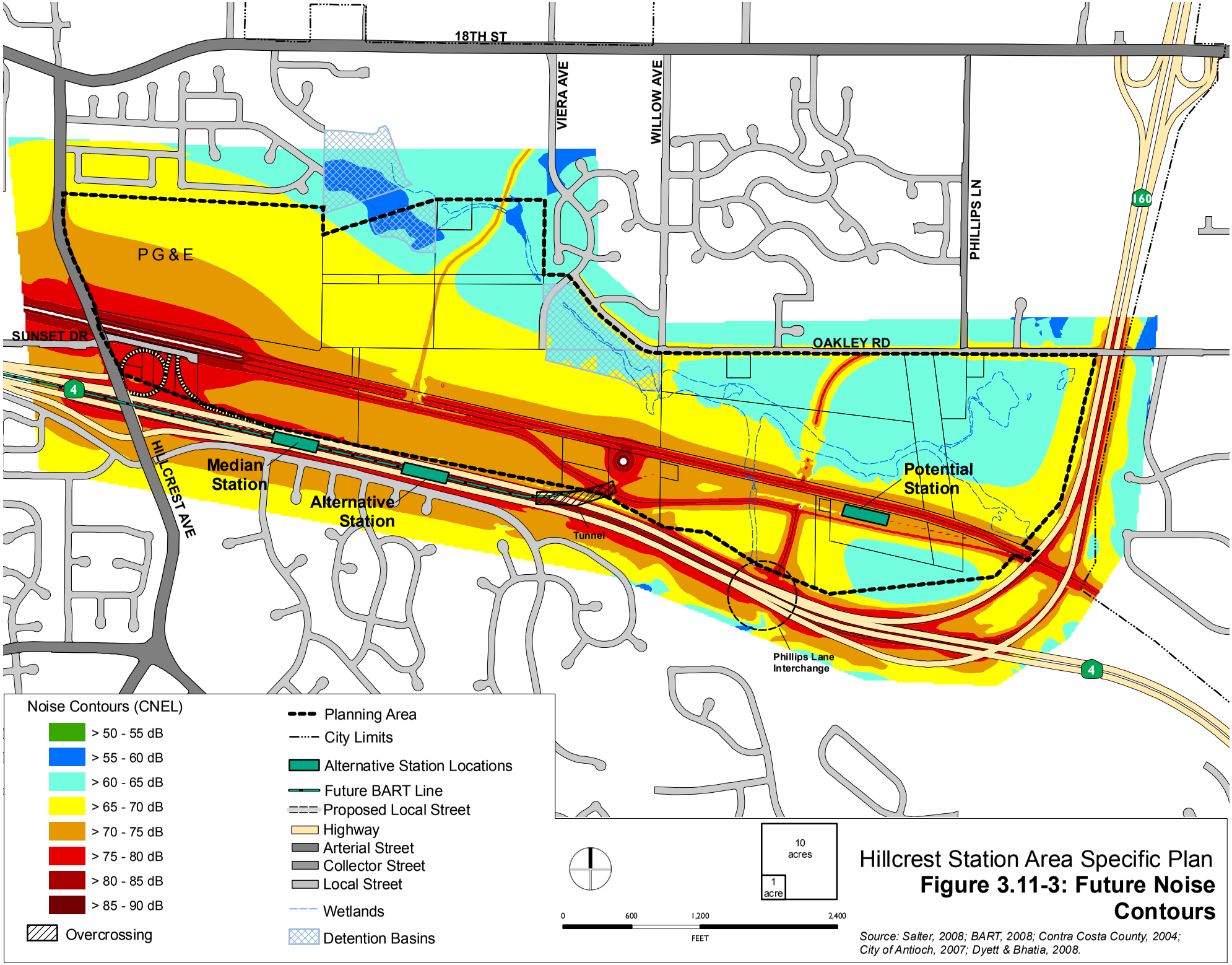
Table 3.11-6 Noise Contour Acres

Contour (dB)	*Acres*	*Percent of Total Area*
<50	0	0%
50 to 55	3	1%
55 to 60	104	28%
60 to 65	130	35%
65 to 70	88	23%
70 to 75	35	9%
75 to 80	13	3%
80 to 85	2	1%

Source: Charles M Salter Associates Inc., Dyett & Bhatia, 2008

The current City standards state that outdoor living areas for residential projects near SR 4, the SR 4 Bypass, and the eBART project may be allowed up to a maximum of 65 CNEL. In 2035, approximately 138 acres of the Planning Area (38 percent) will be within areas with noises levels equal to or greater than 65 dB. The standard for commercial and industrial uses is that the CNEL must be 70 dB or less at the front setback of the building. There will be approximately 50 acres of the Planning Area (13 percent) that exceed this standard. As seen in Figure 3.11-3, these areas are concentrated along SR 4, SR 160, and the railroad. Table 3.11-7 summarizes the distances of the CNEL 70 and 65 dB noise contours from the centerline of major noise sources. These distances do not take into account the local topography or the additive effect resulting from noise sources being located close to each other. The contours illustrated on Figure 3.11-3 take topography and additive effects into account. Individual projects inside the applicable contour will require additional noise analysis to determine the appropriate mitigations to meet the City's standards.

Based on projections of future noise contours (Figure 3.11-3) and land use densities, it is estimated that some proposed development will be in areas that exceed maximum City standards for noise. Approximately 616 Residential TOD units and 724 Town Center Mixed Use units will be in areas with noise levels above 65 dB; and approximately 444,000 square feet of community retail and 142,000 square feet of office TOD will be in areas with noise levels above 70 dB.



Hillcrest Station Area Specific Plan

Figure 3.11-3: Future Noise Contours

Source: Salter, 2008; BART, 2008; Contra Costa County, 2004; City of Antioch, 2007; Dyett & Bhatia, 2008.

Table 3.11-7 Distances to CNEL 70 and 65 dB Noise Contours from the Centerline of Major Noise Sources

Source	*Feet to CNEL 70 dB Contour (Office/Institutional Guideline)*	*Feet to CNEL 65 dB Contour (Residential Guideline)*
SR 4	340	730
SR 160	150	310
eBART	30	60
eBART at track crossovers	60	125
Freight Line	80	170
Freight Line within 0.25 mile of Hillcrest Ave.	400	850

Source: Charles M Salter Associates Inc., 2008

The current City standards also state that development near SR 4, the SR 4 Bypass, and the eBART project may not result in increases greater than five CNEL above existing noise levels. As summarized in Table 3.11-8, four locations within the Planning Area exceed this standard. Each of these locations is adjacent to the Union Pacific Mococo railroad and freight rail will be the primary noise source. If Union Pacific resumes freight rail service on the Mococo line and if no grade separation is provided at Hillcrest Avenue, the noise impacts are significant. However this impact is due to the resumption of rail service, and is not an impact of the Specific Plan.

There are mitigation actions that could reduce the noise levels to a less than significant level. The grade separation at Hillcrest Avenue and the Union Pacific rail line, and a grade separation lowering the elevation of the rail line itself into a below-grade channel, would mitigate the noise impact. However since those projects are not within City control, and there is no identified funding source, these cannot be assumed as mitigations. Therefore the impacts of the railroad line noise on the proposed development under the Specific Plan are significant and unavoidable.

Table 3.11-8 Existing (2008) and Future (2035) Noise Environment

Monitor	*Existing Primary Noise Source(s)*	*Future Primary Noise Source(s)*	*Existing (Msd.) CNEL*	*Future CNEL*
L1	Hillcrest Avenue and bus stop directly to the south	Freight rail line (with horn) and Hillcrest Avenue	63 dB	**79 dB**
L2	Distant SR 4 and Oakley Road	Oakley Road and freight line	65 dB	**67 dB**
L3	SR 4	SR 4	75 dB	**69 dB***
L4	SR 4	SR 4	72 dB	**66 dB***
L5	SR 160	Freight line and SR 160	64 dB	**70 dB**
S1	SR 4	Freight rail line (with horn) and SR 4	52 dB [1]	**73 dB**
S2	Distant SR 4 and Oakley Road	Freight line and eBART	55 dB [2]	**74 dB**

Note: Measurements in **bold** exceed the current City standards.

* At these locations, the noise level is lower in the future due to the planned grading at the site. In the future, these measurement locations will no longer be at the top of the hill, but will be graded down so that there is no longer line-of-sight to SR 4.

1. Calculated from a 15-minute L_{eq} offset from monitor L1
2. Calculated from a 15-minute L_{eq} offset from monitor L3

Source: Charles M Salter Associates, Inc., 2008

Noise mitigation strategies to reduce exterior noise levels include, but are not limited to, the following: noise barriers (e.g., sound walls, fences, or berms), increased building setbacks, and site orientation/layout to shield sensitive outdoor spaces. Noise mitigation strategies to reduce interior noise levels include the incorporation of sound-rated windows/exterior doors and upgraded exterior wall and roof-ceiling assemblies.

Rooftop and other mechanical equipment at commercial uses need to be controlled to CNEL 70 dB at the property line (CNEL 65 dB if the adjacent property is zoned residential). This can typically be accomplished by proper location and orientation of equipment and the incorporation of duct silencers, acoustic louvers, building parapets, and/or mechanical penthouses or enclosed mechanical equipment rooms. Specific mitigation measures will be refined as the project progresses and equipment is selected.

Specific Plan Policies that Reduce Impact

Implementation of the existing General Plan policies and the proposed Specific Plan policies would reduce the potential impact of increased noise but this impact remains significant and unavoidable.

EH-47 Require developers to comply with relevant noise insulation standards contained in Title 24 of the California Code of Regulations (Part 2, Appendix Chapter 12A).

EH-48 Require acoustical analysis performed by a licensed acoustical engineer to determine appropriate noise mitigations in order to meet the City's standards for projects as described below. Building permit applications shall demonstrate that noise mitigations are included in construction documents.

- Residential projects within:
  - 730 feet of the SR 4 centerline;
  - 310 feet of the SR 160 centerline;
  - 170 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way; and,
  - 850 feet from the intersection of Hillcrest Avenue and the Union Pacific Mococo Rail Line (or the location(s) where freight trains sound horn).
- Institutional and Office projects within:
  - 340 feet of the SR 4 centerline;
  - 150 feet of the SR 160 centerline;
  - 80 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way;
  - 400 feet from the intersection of Hillcrest Avenue and the Union Pacific Mococo Rail Line (or the location(s) where freight trains sound horn);
  - 30 feet of the eBART track centerline; and
  - 60 feet from the eBART at track crossovers ("frogs").

EH-49 Where projects in the Hillcrest Station Area incorporate noise mitigations and still cannot achieve City standards for exterior noise levels, as determined by acoustical analysis by a licensed acoustical engineer, project sponsors may apply for an exception to City exterior noise standards.

- Such exception requests will be considered through a discretionary development entitlement process.
- Projects requesting exceptions to exterior noise standards should demonstrate that:
  - (1) all feasible noise mitigations have been incorporated to lower exterior noise levels as close as possible to City standards; and
  - (2) noise mitigations that lower interior noise levels below the City and state standard of 45 dB have been incorporated, to compensate for the high exterior noise levels which make outdoor activities uncomfortable.

EH-50 In new residential projects, provide noise buffers other than sound walls, such as vegetation, storage areas, or parking, and site planning and locating bedrooms away from noise sources.

EH-51 Work with Union Pacific to minimize noise issues related to freight rail by implementing a grade separation at Hillcrest Avenue, and establishing a quiet zone through the Station Area.

LU-23 Locate residential units away from railroads and freeways, to minimize impacts from noise and air emissions. Units should be at least 300 feet away from rail and freeway rights-of-way, or incorporate construction measures that mitigate noise and air emission impacts.

Mitigation Measures

No mitigation measures required.

3.11-2 ***New development under the Specific Plan may result in exposure of people and noise-sensitive uses to temporary noise and vibration impacts related to construction activities. (Less than Significant)***

Although the related noise and vibration impacts at any one location would be temporary, construction of individual projects within the Planning Area could cause adverse localized effects on the ambient noise environment. Construction activities would occur intermittently at different sites throughout the period of implementation of the proposed Specific Plan. Therefore, construction-related noise and vibration levels at and near the project site would fluctuate depending on the phase of construction, and the type, number, and duration of uses of various pieces of construction equipment. The potential construction-related noise and vibration impacts on depend on the proximity of construction activities to sensitive receptors, the presence of intervening barriers, the number, and the types and duration of construction equipment used. Construction noise levels could be substantially greater than existing noise levels at nearby sensitive receptor locations and could increase noise levels in close proximity to the construction site by more than five (5) CNEL.

Specific Plan Policies that Reduce Impact

The proposed Specific Plan recognizes that construction noise, although temporary, could lead to increased noise levels and could affect sensitive receptors. The Antioch Municipal Code defines regulations to control construction noise through restrictions on working hours. These restrictions would be applicable for all projects within the Planning Area. Compliance with these regulations and the following proposed Specific Plan policy would ensure that construction noise impacts would be less than significant.

EH-52 Require developers to mitigate noise exposure to sensitive receptors from construction activities. Mitigation may include a combination of techniques that reduce noise generated at the source, increase the noise insulation at the receptor, or increase the noise attenuation as noise travels from the source to the receptor (e.g., through the incorporation of barriers).

Mitigation Measures

No mitigation measures are required.

3.11-3 ***Freight rail activity could expose existing and future development to groundborne vibration. (Less than Significant)***

Union Pacific has announced plans to increase the number of freight trains on the Mococo Line running through the Planning Area from as many as 10-15 trains per day starting in 2010 or later, and up to as many as 25-40 trains per day in the long term. As part of the worst case scenario, 40 trains are assumed to be evenly spread throughout the day and night in 2035. The FTA guidelines state that for occasional train activity (defined as 30 to 70 events per day), the ground vibration velocity at high-sensitivity uses (e.g., vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations) should not exceed 65 VdB (re: 1 microinch/second), residential land uses should not exceed 75 VdB, and institutional land uses should not exceed 78 VdB.

Based on the critical screening distances for freight rail vibrations provided by the FTA, a detailed vibration analysis should be conducted for high-sensitivity uses planned closer than 600 feet, residential buildings planned closer than 200 feet, and institutional buildings (e.g. schools, churches, and offices) planned closer than 120 feet from the railway. However, these are guidelines used to predict the level of vibration impact on land uses in the vicinity of a railway. There are no specific Building Code requirements for vibration levels in buildings.

Specific Plan Policies that Reduce Impact

EH-53 Require vibration velocity analysis to determine appropriate mitigations for proposed:

- Residential projects within 200 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way;
- Institutional and Office projects within 120 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way; and,
- High-sensitivity use projects (e.g. hospitals and medical labs) within 600 feet from the centerline of the Union Pacific Mococo Rail Line right-of-way.

Mitigation Measures

No mitigation measures are required.

3.12 Public Services

This chapter presents the environmental setting and impact analysis for public services in the City of Antioch related to the Hillcrest Station Area Specific Plan. The public services included in this EIR include public safety services and facilities, schools, parks, and other public facilities.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

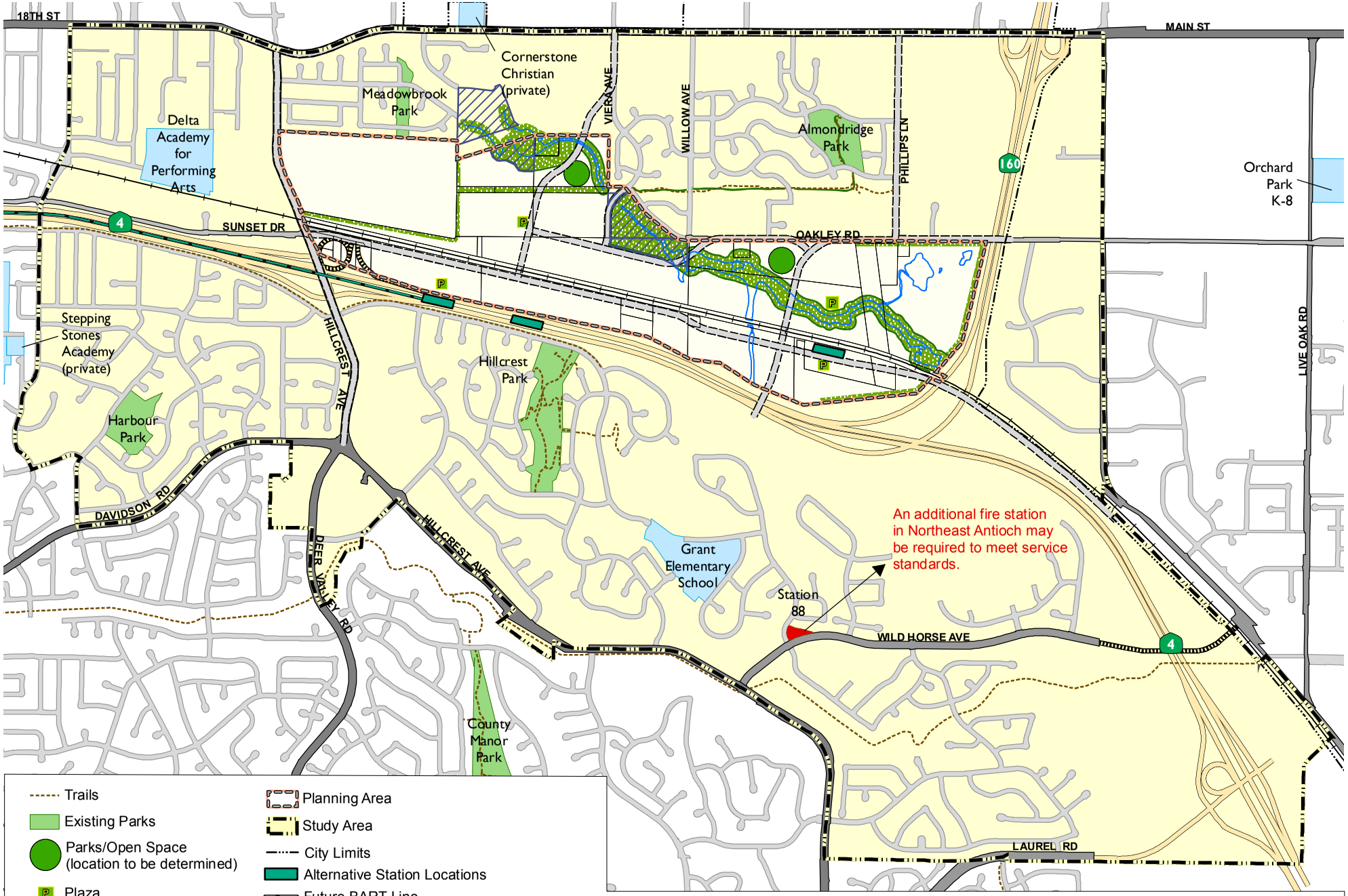
Fire and Other Emergency Services

The Contra Costa County Fire Protection District (CCCFPD) provides fire and emergency services to residents of the City of Antioch and adjacent unincorporated areas, including fire fighting and rescue, fire prevention and training, and emergency medical care. The CCCFPD is the first responder providing supplemental basic life support (BLS) and advanced life support (ALS). Transportation is provided by Emergency Medical Response (AMR), a private ambulance service contracted by the CCCFPD. The District's current ISO rating is Class 3.

Four CCCFPD fire stations are located within the City of Antioch, each with a minimum of three personnel per engine company (one Captain, one Engineer, and one Firefighter/Paramedic) 24 hours per day. All personnel are Emergency Medical Technicians with training in defibrillators (EMT-D) level and are paid professionals. The District employs a total of 406 paid personnel. In addition to the existing stations, two new stations are proposed to serve the Antioch area, and a long-term plan for an additional station in southeast Antioch is also under consideration. An administration office, Administration East, is located at 4527 Deerfield Drive. Fire stations are located at the following addresses:

- #81 – 315 West 10th Street
- #82 – 196 Bluerock Drive
- #83 – 2717 Gentrytown Drive
- #88 – 4288 Folsom Drive
- Proposed 1 – Sand Creek and Deer Valley Road
- Proposed 2 – TBD within southeast Antioch

The adopted City standard for fire response is a maximum five-minute response time for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis. In 2007 the average response time for the four active stations in the City of Antioch was three minutes and 40 seconds (00:03:40). This does not include dispatch or turnout time. Based on an estimated 30 mile per hour travel speed, the five-minute response time roughly correlates with a 1.5-mile service radius from each station. At this time, there are no fire stations that are able to provide service to the Planning Area within the adopted response time standard.



Hillcrest Station Area Specific Plan

Figure 3.12-1: Existing & Future Public Services

Source: Contra Costa County, 2008; City of Antioch, 2007, Dyett & Bhatia, 2008.

Fire Flows

Water pressure typically is maintained between 40 and 100 pounds per square inch gage in the City of Antioch. The Planning Area is split in two Pressure Zones, primarily Zone II and a small portion in Zone III East. Water pressure and fire flow requirements are addressed on a case-by-case basis as development projects are submitted.

Police

The Antioch Police Department provides crime prevention and law enforcement services within the City's boundaries. Operating from a central station within Rivertown, the Antioch Police Department maintains a combination of professional sworn officers and non-sworn positions, along with volunteer positions.

The adopted City standard for police services is to maintain a minimum of 1.2 and a maximum of 1.5 officers per 1,000 residents. This includes community service officers assigned to community policing and prisoner custody details, which may not exceed 20 percent of the total number of sworn officers. With 124 sworn officers and 20 civilian officers, the City meets the current standard.

It is the City's objective to provide average response times to emergency calls of between seven (7) and eight (8) minutes from the time the call is received to the time an officer arrives on scene. From January through September 2008, the citywide average response time for Priority 1 (highest priority/emergency) calls was seven minutes and nine seconds (00:07:09). The Hillcrest Station Area is currently in Beat 2. During the same time period, the average response time for Priority 1 calls from Beat 2 was six minutes and 42 seconds (00:06:42), which meets the City's objective. (Cantando, 2008)

In addition to city police and the California Highway Patrol, BART has a police department which provides the full range of police services for their transit facilities.

Schools

Enrollment and Capacity

The Planning Area is served by the Antioch Unified School District (AUSD). AUSD has a K-12 enrollment of approximately 19,200 students. The district includes fourteen elementary schools, four middle schools, five high schools, two continuation schools and a K-8 Charter School. In addition the school district operates an Adult School. (Antioch Unified School District, 2008) Based on 2006-2007 enrollment data, the elementary schools were at 100 percent capacity. The middle schools were at 106 percent capacity and the high schools were at 113 percent capacity. With the addition of the three new schools – one elementary and middle school and two high schools - that opened in Fall 2008, school capacities are potentially reduced to 95 percent for elementary schools, 101 percent for middle schools, and 97 percent for high schools for the current year. In addition to AUSD schools, the City of Antioch has two charter schools and at least eight private schools.

2015 Enrollment Projections

The Antioch Unified School District's has enrollment projections for the year 2015. In that year, enrollment is expected to total about 19,300 students, which is only 100 more students than

existing conditions. Elementary schools are projected to be at approximately 96 percent capacity. Middle schools are projected to be at approximately 101 percent capacity. High schools are projected to be at approximately 79 percent capacity, which is much less than the 2006-2007 school year. These projections take into account the current real estate market and foreclosures, demographic shifts, and recent enrollment trends. As such, AUSD has no plans to build any new schools.

Planning Area Schools

Students from new housing built in the Planning Area are likely to attend the following schools, which are shown on Figure 3.13-1:

- Orchard Park School will serve as the elementary and middle school for the Planning Area. It is a new school located on 11.9 acres in the City of Oakley, 5150 Live Oak Avenue. It has a total future capacity of 750 students.
- Deer Valley High School, 4700 Lone Tree Way, is the public high school for the area. For the 2006-2007 school year, it was at 119 percent capacity with almost 3,300 students. It is anticipated that the opening of two new high schools should relieve some of the over-crowding at Deer Valley High School.
- Dozier-Libbey Medical High School opened in Fall 2008 with a capacity of 215 students, and a total future capacity of 729 students.
- The Delta Academy for Performing Arts also opened in Fall 2008 for 80 students and will have a future capacity of 216.

Parks

The City owns and administers 31 parks, varying in size and amenities from the 2-acre Deerfield Park (a neighborhood park) to the 99-acre Prewett Family Park (one of the city's two community parks.) Over 400 acres of parks, open space areas, and marinas are located within the City, 200 acres of which are developed. The remaining 200 acres primarily consists of open space (e.g., the Sunnyridge Park and trail system). The Parks and Recreation Commission, which consists of citizens-at-large appointed by the City Council, provides information and recommendations to the Council related to park management, landscaping, and recreational programs.

In 2007, the City population was estimated to be 100,150. With a total of 400 acres of parks, the existing park ratio is 4.0 acres per 1000 population. The existing parks, trails, and schools near the Planning Area are shown in Figure 3.12-1. Youth organizations in collaboration with City staff have developed a nine-field baseball complex and are currently working on a three-field soccer facility. Even with these facilities, the existing demand for recreational facilities exceeds the number of fields available.

The City uses the following park classifications:

- ***Neighborhood Park***. A park or playground generally five to ten acres in size primarily developed to meet the recreational needs of citizens living within 0.5 to one mile.
- ***Joint School/Park***. A neighborhood park development, improved, and maintained on or adjacent to school grounds by the City. Joint school/park facilities are utilized jointly by students and residents from the surrounding neighborhoods.

- ***Community Park***. A larger park or facility developed to meet the park and recreational needs of those living or working within a three to five mile radius. Community parks generally range in size from 10 to 60 acres.
- ***Regional Park***. A park having a wide range of improvements not usually found in neighborhood or community parks, and designed to meet recreational needs of an entire regional population. Regional parks are generally over 100 acres and serve a population within a 30-minute driving time. Regional parks are generally provided by East Bay Regional Parks District, and are therefore not included in local park standards.
- ***Specialized Recreation Areas***. These include recreational areas of facilities devoted to specific activities or uses. Examples include trails, sports and ball field complexes, swimming pools, river access and viewing areas, bicycle facilities, and riverfront trail and sitting areas, and marinas and boat launch facilities.

Existing Parks and Recreation Facilities

Neighborhood Parks

There are three neighborhood parks within a half mile to a mile of the Planning Area – Meadowbrook, Almondridge, and Hillcrest Parks. These parks are located in existing residential neighborhoods. Meadowbrook Park is an 8.5-acre park at Yellowstone Drive and Calaveras Circle, with BBQ pits and picnic tables, basketball and volleyball courts, and a youth play area. Almondridge Park, 5.4 acres, is located at Almondridge Drive and Beechnut Street and has restrooms, BBQ pits and picnic tables, soccer and softball fields, tennis courts, and tot and youth play areas. Hillcrest Park is 18 acres at Larkspur and Sunflower Drives. It is located south of SR 4, and thus is much less accessible from the Planning Area. This park has restrooms, BBQ pits and picnic tables, basketball, volleyball and tennis courts, an exercise course, and tot and youth play areas.

Community Parks

Antioch Community Park is located on James Donlon Boulevard at Blyth Drive, approximately three miles from the Planning Area. This 20-acre park has BBQ pits, a group picnic area that can be reserved, as well as soccer and softball fields, volleyball courts, tot and youth play areas, and trails. Prewett Family Park is about 2.5 miles from the Planning Area at Lone Tree Way and Deer Valley Road. This 99-acre park currently is the site of the municipal pool, a water park, and skate park. In addition, there are BBQ pits, a group picnic area that can be reserved, restrooms and trails. A community center and potentially a library kiosk are planned.

The private, non-profit, Wilbur Youth Sports Complex, is located about one mile north of the Planning Area at Wilbur Avenue and Apollo Court. The complex has approximately nine softball fields, plus soccer fields.

Regional Parks andTrails

The East Bay Regional Park District (EBRPD) operates three facilities in the Antioch area, Antioch Regional Shoreline, Black Diamond Mines Regional Preserve, and Contra Loma Regional Park. None are in the vicinity of the Planning Area. EBRPD oversees the Delta DeAnza Regional Trail, which runs from Pittsburg to Oakley, south of the Planning Area.

Recreation

The Recreation Department offers a variety of programs for all ages. Sports classes and leagues, including golf and tennis lessons, soccer and softball leagues, are offered throughout the year at various community and neighborhood parks. Youth summer camps are also offered. Classes such as yoga, babysitting certification, swimming lessons, and art classes are scheduled at the Nick Rodriguez Community Center and the Prewett Family Park Center.

Park Acquisition and Maintenance

The standard defined in the General Plan is to "provide five acres of improved public and/or private neighborhood parks and public community parkland per 1,000 population, including appropriate recreational facilities." The City of Antioch receives land for parks through land dedications or purchases funded through park fee collection. All park dedication requirements are based on the Quimby Act, the State law regulating park exactions. Article 10 of the Subdivision Ordinance contains the criteria for park dedications and fees. The City is in the process of updating its park fees.

The Parks Division provides maintenance for all City parks, which is funded by the General Fund. Landscape and Lighting Districts (LLADs) have been instituted to provide funding for maintenance of streetscape landscaping and open space areas.

Other Community Facilities

Community Facilities

Antioch defines community facilities as buildings needed to support daily operations of the City, as well as other buildings designed for community meetings, indoor recreational and instructional programs, and social activities. The adopted City standard is to maintain a minimum of 750 square feet (sf) of community center space per 1,000 residents. Examples of community facilities in Antioch include:

- The Nick Rodriguez Community Center, located at 213 F Street, has meeting rooms, a 200-person theater, and a 200-person multi-use room that can be rented.
- The Antioch City Council has recently approved the conceptual design of a 35,000 sq. ft. Community Center and Police Service Center at Prewett Family Park. The facility will be state of the art and will include a variety of spaces, such as a gym, technology center, classrooms, meeting rooms, a City Hall Kiosk, and potentially a library kiosk. The project is scheduled to be completed in the fall of 2010.
- The Antioch Senior Citizens Club is located at 415 West Second Street in Rivertown and offers a variety of activities and trips for adults over 50 years old.
- The Antioch Library Branch is located at 501 W. 18th Street. This branch is approximately 11,000 square feet. In 2005 the library had about 73,200 book and 30 computers. Contra Costa Library System (CCLS) manages the library service for the City of Antioch.

REGULATORY SETTING

Definitions

Emergency Response Time

The National Fire Protection Association (NFPA) defines "response time" as "the travel time that begins when units are en route to the emergency incident and ends when units arrive at the scene."

ISO Rating System

Insurance Service Office (ISO) is a private company that inspects and ranks fire departments across the country to help insurance companies determine premiums for homeowners in the areas they serve. The ISO collects and analyzes firefighting capability information on nearly 46,000 areas and rates departments on fire suppression ability, water availability and communications. ISO's methodology, known as the Fire Suppression Rating Schedule, assigns a class rating on a scale of 1 to 10, with Class 1 given to exemplary fire departments and Class 10 to departments that do not meet minimum criteria.

Community Center

Community centers consist of buildings, other than City Hall, designed for community meetings, indoor recreational and instructional programs, and social activities. Included in the definition of community centers are such specialized facilities as senior centers, youth centers, and gymnasiums.

Federal Regulations

Fire

The National Fire Protection Association publishes the Uniform Fire Code with provides standards for fire protection. The nationally recognized standards require that fire departments "have the capability to deploy an initial full alarm assignment within eight (8) minute response time to 90 percent of the incidents." (NFPA 1710)

State Regulations

State law allows a city or county to impose fees as a condition of approving any development project if it can demonstrate a relationship between the fee and the purpose for which it is being earmarked. The jurisdiction must conduct studies to demonstrate a reasonable relationship between the need for the public facility and the type of development project. It must also be able to show there is a reasonable relationship between the amount of the fee and the cost of the public facility attributable to the development (California Government Code section 66000 et. seq.).

Parks

The 1975 Quimby Act (California Government Code section 66477) authorized cities and counties to pass ordinances requiring that developers set aside land, donate conservation easements, or pay fees for park improvements. The Act states that the dedication requirement of parkland can be a minimum of 3 acres per thousand residents or more, up to 5 acres per thousand residents if the existing ratio is greater than the minimum standard. Revenues generated through in lieu fees collected and the Quimby Act cannot be used for the operation and maintenance of park facilities. In 1982, the act was substantially amended. The amendments further defined

acceptable uses of or restrictions on Quimby funds, provided acreage/population standards and formulas for determining the exaction, and indicated that the exactions must be closely tied (nexus) to a project's impacts as identified through studies required by the California Environmental Quality Act (CEQA).

Regional and Local Regulations

The Contra Costa County Fire Protection District (CCCFPD) provides fire and life safety services. The Uniform Fire Code established by the International Conference of Building Officials both prescribe performance characteristics and materials to be used to achieve acceptable levels of fire protection. The local fire impact fee was updated in 2007 at the request of the Contra Costa County Fire Protection District. Law enforcement services in Antioch are provided by the City of Antioch Police Department along with additional law enforcement services provided by the California Highway Patrol and the Contra Costa County Sheriff. The Antioch Unified School District is the provider of K-12 public schools. The Contra Costa Library System (CCLS) provides the library service for the City of Antioch.

Local Standards: Antioch General Plan

Fire

3.5.2.2 Performance Standard

Prior to approval of discretionary development projects, require written verification from the Contra Costa County Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis.

8.10.2 Fire Protection Policies

a. Work with the Contra Costa County Fire Protection District to provide high quality fire protection services to area residents and businesses. The City's role should include, but not be limited to:

- Determining the appropriateness of station location sites;
- Enforcement of building codes to reduce fire hazards;
- Collection of mitigation fees established by the fire district to construct needed additional stations within the Antioch Planning Area.
- Support the District in providing funding for personnel costs to staff stations within the City;
- Support the District in establishing fees that are adequate to mitigate the impacts of new development and income to support operation of new stations whose construction is financed with development fees; and
- Requiring reasonable reservation of appropriate sites for new fire stations as part of new development.

b. In cooperation with the Contra Costa County Fire Protection District, conduct an annual assessment of the adequacy of facilities and services serving Antioch, personnel and staffing needs, and capital needs, based on anticipated growth and the level of service standard set forth in the Growth Management Element. This assessment should be undertaken as part of the annual

review of proposed capital projects required by the California Government code (see Chapter 12, Implementation, Section 12.4b).

c. Provide the Contra Costa County Fire Protection District with timely information on development proposals and projected levels of future growth so that it can maintain appropriate long-term master plans and refine the delivery of service and facilities to maintain the performance standards set forth in the Growth Management Element.

d. Involve the Fire Protection District in the development review process by referring development requests to the Fire District for review and comment.

Police

3.5.3.1 Performance Objective

Maintain an active police force, while developing programs and police facilities that are designed to enhance public safety and protect the citizens of Antioch by providing an average response time to emergency calls of between seven and eight minutes from the time the call is received to the time an officer arrives.

3.5.3.2 Performance Standard

Maintain a force level within a range of 1.2 to 1.5 officers, including community service officers assigned to community policing and prisoner custody details, per 1,000 population. The ratio of community service officers assigned to community policing and prisoner custody details to sworn officers shall not exceed 20 percent of the total number of sworn officers.

8.11.2 Police Services Policies

a. Provide an adequate police force meeting the performance standards for police services set forth the Growth Management Element.

- As part of the annual budget and capital improvements program, assess crime prevention and law enforcement services, and evaluate the adequacy of Antioch's facilities and services, personnel and staffing needs, and capital needs, based on anticipated growth and the level of service standard set forth in the Growth Management Element.

b. Provide sufficient facilities and staffing to ensure the safety of the citizens of Antioch by:

- Providing expedient response to emergency calls.
- Maintaining an efficient well-trained and adequately equipped force of police personnel.
- Providing neighborhood watch and crime prevention programs, and attempting to improve the participation of individual neighborhoods and businesses.
- Continuing to provide a variety of programs within the Police Department (e.g., traffic crime prevention, REACH, narcotics, investigations) to meet the needs of an active community.

c. Provide basic requirements and incentives for the provision of design features in new development to reduce the potential for crime.

- Provide well-lighted and visible streets and street names, entrances, addresses, recreation areas, and parking areas.

- Limit access into and between buildings to reduce escape routes and undetected entry is made difficult.
- Provide landscaping which permits surveillance of open areas and entryways, and does not create places for concealment.
- Within multi-family and non-residential developments, design access systems to allow emergency vehicle access around buildings to the greatest extent possible.
- Within multi-family and non-residential developments, eliminate the potential for access to roofs by pallets, flag poles, etc.
- Involve the Antioch Police Department in the development review process by referring development requests to the Police Department for review and comment.
- Promote community involvement in crime prevention.
- Promote the establishment and operation of neighborhood watch, park watch, and business watch programs.
- Work with area schools to maintain educational programs aimed at preventing gang and drug-related activities.

Schools

3.5.8.1 Performance Objective

The General Plan performance objective is the provision of schools in locations that are readily accessible to student populations, along with sufficient facilities to provide educational services without overcrowding.

3.5.8.2 Performance Standard

Require new development to provide necessary funding and/or capital improvements to mitigate projected impacts on school facilities as determined by the responsible school district.

8.8.2 School Facilities Policies

a. Maintain clear, ongoing communications with area school districts on all matters related to the need for and provision of school sites and other administrative, educational, and recreational facilities.

b. Coordinate the planning efforts of the City and local school districts by:

- locating school facilities to facilitate the primary educational purpose of the facility and allow for safe pedestrian, bicycle, and vehicular access, including the provision of traffic calming measures, where appropriate, in the vicinity of schools;
- maximizing the joint use of facilities by the City and local school district (including, joint school/park sites and, where feasible, joint use of athletic fields, community meeting facilities, and provision of child and senior care facilities) by developing joint funding for such facilities through a combination of school district and City sources, provided that City contributions to joint facilities are consistent with the availability of such joint facilities to meet non-school recreational and other community needs;
- designing attractive facilities that can also serve as neighborhood and community gathering places, and contribute to neighborhood identity and pride;

- requiring reasonable reservation of appropriate locations for development of new schools as part of new development;
- regularly exchanging information on (1) the status of development review and construction, (2) the capacity of area schools, (3) the status of site acquisitions by the districts, and (4) applicable student generation factors by type of development.

c. Require new development to pay all legally established fees or participate in land-based financing districts established by local school districts for the acquisition and development of school sites with adequate, permanent classroom space, as required by the local school district.

d. Maintain land development regulations permitting the development of public and private educational facilities at appropriate locations within the Planning Area.

e. Provide incentives in the City's residential growth management program for the provision of developer assistance to local school districts beyond nominally required mitigation fees. The objective of such incentives is that the combination of required fees and incentives provide a full contribution proportional to the needs of the proposed development for all school-related facilities to serve the proposed project.

f. Work with Los Medanos College to further accessibility to and the quality of local community college education.

g. Work with public and private universities (e.g., CSU Hayward, University of Phoenix) to create satellite campuses within Antioch.

h. Work with trade schools (e.g., DeVry Institute, ITT Technical Institute, Bryman) to locate new facilities in Antioch.

Parks and Recreation

3.5.7.2 Performance Standard

Provide five acres of improved public and/or private neighborhood parks and public community parkland per 1,000 population, including appropriate recreational facilities.

8.9.2 Parks and Recreation Policies

c. Maintain a minimum size for neighborhood parks of five acres or more, unless there is a specific need for a smaller facility.

e. Provide passive and active elements within neighborhood and community parks to meet the needs of citizens of all ages and interests, and thereby ensure that the need for lands for athletics and team sports is equal to the provision of tranquil settings for picnicking, walking, and relaxation.

f. Develop athletic field complexes and specialized recreation areas to accommodate the growing community needs for such facilities.

g. Encourage the preservation of significant natural features and development of landscaped parkways and trail systems in new developments in addition to required park development.

h. Work with Contra Costa County to establish joint use flood control/ recreational facilities, including multi-use trails and open space along channels and creeks, and within detention basins.

i. Provide incentives in the City's residential growth management program for the dedication and improvement of usable parklands beyond those normally required by the City.

j. Provide incentives for private individuals to donate land and funds for park development to the City by establishing a means to accept tax-deductible donations, which may also include donation of equipment and facilities.

k. Seek partnership opportunities with the private sector and non-profit organizations for the acquisition, development, and maintenance of park facilities and the provision of leisure activities.

l. Recognize that high quality maintenance and upkeep of park facilities is necessary for the economic health of the community, and place appropriate priority on park maintenance.

m. Locate new park facilities so that they are highly visible from adjacent streets and neighborhoods to increase safety and enhance visual quality.

n. Require the provision of private play space for children in small lot single family subdivisions and attached residential developments.

o. In addition to the provisions of the Quimby Act, pursue use of park fees through grants, the provisions of AB1600, and land-based financing districts.

p. Establish limitations on the amount of private recreational facilities (e.g., swimming pools, tennis courts, and private parks) that can be substituted for public park dedication of payment of fees. Base such limitations on the extent of public access to the facilities and the extent to which such private facilities might serve public recreation needs.

Library and Community Facilities

3.5.1.2 Performance Standard

Maintain a minimum of 750 square feet of community center space per 1,000 population.

8.3.2 Public Facilities Policies

b. Maintain a system of community centers to meet the needs of Antioch's residents for civic meetings, recreational activities, social gatherings, and senior and youth activities. These facilities should be distributed throughout the community, and may be associated with community parks or other public facilities. Specialized community centers providing citywide services for seniors and youth are also appropriate.

d. Work with the Contra Costa Library System to achieve and maintain facilities and titles consistent with the standards of the American Library Association.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact on the public services if the Plan would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: fire protection; police protection; schools; parks; or other public facilities.

Fire Protection

- Place residents or the general public in a situation of endangerment as a result of inadequate fire services, resources, and/or safety measures; or
- Create or exacerbate an existing fire hazard or expose people to high fire hazard conditions without adequate fire protection.

Police Protection

- Result in a substantial need for police services that could not be provided by available Police Department personnel or equipment.

Schools

- Result in increased student population and associated public educational needs which existing or planned facilities cannot adequately serve.

Parks and Recreation

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Community Facilities

- Result in not meeting the City standard for community center space.

METHODOLOGY AND ASSUMPTIONS

Population estimates are based on the average household size by housing type as reported in the 2000 Census Block Groups. Single-household units are assumed to have the same household size as the rest of the City of Antioch, which is 3.18 persons per unit. Population estimates for multi-family units are based on an average of the Antioch multi-family household size (2.42) and the average household size around three Contra Costa BART Stations – Concord, Pleasant Hill, and Walnut Creek (1.57). Multi- family households are assumed to have 2.0 persons each.

Fire Protection Services

The need for additional fire stations, staffing and equipment is evaluated based on the adopted City standard for average response times of five minutes for emergency calls. GIS network analysis was used to determine the approximate distance from the existing fire stations to the Planning Area on existing roads. The analysis showed that no existing station could serve the planning area and meet the response time standard. The Contra Costa County Fire Protection District substantiated this finding.

Police Services

Police services are evaluated based on the adopted ratio of police officers, which is a minimum of 1.2 and a maximum of 1.4 officers per 1,000 residents. Using the estimated population from the residential development within the Planning Area, the number of new officers needed is determined.

Schools

The Antioch Unified School District enrollment projections and student generation rates were used to evaluate the cumulative impact of development within the Planning Area on local schools. AUSD uses the following table of student generation rates to plan needed capacity improvements:

Table 3.12-1 Student Generation Rates

	Elementary	*Middle*	*High*
Multi-family	0.10	0.045	0.08
Single Attached	0.21	0.10	0.15
Single Detached	0.31	0.15	0.21

Source: Antioch Unified School District, 2008.

Parks

The proposed Specific Plan uses the City's adopted standard for park requirements which is five acres of improved public and/or private neighborhood parks and public community parkland per 1,000 residents.

Other Community Facilities

The City has adopted a standard of 750 square feet of community center space per 1,000 residents.

SUMMARY OF IMPACTS

Fire Protection Services

In order for CCCFPD to continue meeting the City standard for fire protection, either significant access and circulation improvements would need to be built and existing fire facilities, equipment, and staffing would have to be upgraded; or a new station would need to be built in or near the Hillcrest Station Area. CCCFPD will need to conduct an analysis to determine their precise needs to adequately serve the Station Area. This impact would be potentially significant; however, proposed Specific Plan policies ensure that the impact on fire facilities would not place residents or the general public in danger as a result of inadequate fire services, resources, and/or safety measures. Therefore, this impact is less than significant.

Police Protection

Implementation of the development in the Hillcrest Station Area Specific Plan would require the Antioch Police Department to hire approximately six (6) additional police officers. This is not considered a substantial need for additional police services beyond what would normally be provided, as new development pays taxes that augment the City's General Fund used to pay for public services; therefore, this impact is less than significant.

Schools

Based on population growth estimates and student generation rates, Antioch Unified School District anticipates that public elementary schools will be slightly overcrowded in 2035. It is likely that 250 new elementary school children potentially generated by new housing units in the Planning Area would contribute to the problem, which is exacerbated by limited access to other

elementary schools south of the Station Area. Middle schools and high schools are not expected be to be overcrowded in 2035 and should be able to accommodate the students from the Planning Area. AUSD currently has no plans to rehabilitate or expand any existing schools or build new ones at this time; however, the AUSD Facilities Master Plan is currently being updated. The General Plan and City regulations require that new development provide necessary funding and/or capital improvements to mitigate projected impacts on school facilities. AUSD policies require that developers pay school impact fees for new construction of residential units and commercial space. This impact is less than significant.

Parks and Recreation

The combination of the proposed East Antioch Creek trail, plus public and private parks and plazas meets the expected park requirements for the Planning Area given the anticipated population at buildout. The City's Subdivision Ordinance requires that park land be dedicated as part of development requirements. The proposed Plan policies support the creation of sufficient public and private open space to meet the City's requirements and ensure that parks and recreation facilities are maintained; therefore, this impact is less than significant.

Community Facilities

Compliance with General Plan and proposed Specific Plan policies will ensure that the City adopted standard of 750 square feet of community space per 1,000 residents is met or exceeded. This impact is less than significant.

IMPACTS AND MITIGATION MEASURES

3.12-1 ***Development pursuant to the adoption of the Hillcrest Station Area Specific Plan will require fire protection services that exceed current staffing and facilities. (Less than Significant)***

Additional analysis based on development site plans is needed to determine the exact fire protection services needed to serve the Planning Area. However, at this time, no station is located within 1.5 miles of the Planning Area, which estimates the 5-minute response time standard. In addition, the nationally recognized standard (NFPA 1710) states that the Fire District "shall have the capability to deploy an initial full alarm assignment within eight (8) minute response time to 90 percent of the incidents." Currently, all five (5) pieces of apparatus that would be assigned to the first full alarm emergency within the Planning Area would exceed the 8-minute response time by approximately one to six minutes. (Leach, 2008)

The Contra Costa County Fire Protection District (CCCFPD) states that a new station will be needed to serve the area. The station need not be located within the Planning Area, but within the required service radius. The station will require staffing for a new engine company and equipment, likely to include two engines. The new station would require approximately one acre of land. (Leach, Hillcrest Station Area Specific Plan EIR: NOP Comments, 2008)

The increase in population, businesses, and vehicular traffic resulting from the buildout of the Planning Area under the proposed Plan will increase the demand for emergency and fire services, and has the potential to impact response times and firefighting operations. The construction of a new highway interchange at Phillips Lane may improve access from existing stations, but is

unlikely to change the need for a new fire station in or near the Planning Area. Compliance with the General Plan and proposed Specific Plan policies will ensure that the impacts on fire protection services are less than significant.

Specific Plan Policies that Reduce Impact

Compliance with the Antioch General Plan and the following proposed Specific Plan policies would ensure that the impact on fire protection services would be less than significant:

UT-20 At the time of any development application, subdivision, or master plan submittal, inform the CCC Fire Protection District, and involve them in the development review process. Prior to approval of any discretionary development project in the area, require written verification from the CCC Fire Protection District that a five minute response time (including three minute running time) can be maintained for 80 percent of emergency fire, medical, and hazardous materials calls on a citywide response area basis.

UT-21 Project sponsors are required to submit a minimum of three (3) copies of a site plan for each phase of development so that Contra Costa County Fire Protection District is able to determine the placement of fire hydrants, required fire flow, and review of access in order to ensure compliance with minimum requirements as set forth in the California Fire Code.

UT-22 The City and project sponsors in the Planning Area shall work with the Contra Costa County Fire Protection District to provide a 1-acre building site at a location subject to approval by the Contra Costa County Fire Protection District.

UT-23 Fire access roadways and fire hydrants shall be installed and in service prior to construction.

UT-24 Traffic signals, which are installed or modified as part of this Specific Plan, shall have preemption devices (Opticom) installed.

Mitigation Measures

No mitigation measures are required.

3.12-2 *New development in the Hillcrest Station Area will require additional police services that exceed current staffing. (Less than Significant)*

The increase in population, business traffic, and vehicular traffic resulting from the buildout of the Hillcrest Station Area Specific Plan will increase the workload of the Antioch Police Department (APD). In addition, given the expected change in land uses, traffic flows, and number of residents generated by the proposed Specific Plan, the nature of police needs in the plan area will change significantly compared to current conditions.

To maintain current levels of service, an increase in staffing will be necessary. Given that buildout will support approximately 5,000 new residents, the APD will need to hire approximately six additional officers. This is not considered a substantial need for additional police services beyond what would normally be provided, as new development pays taxes that augment the City's General Fund used to pay for public services. The City should also anticipate investing in additional APD communications, patrol staff, and the patrol vehicle fleet. It is not anticipated that

any new police building facilities will be needed. Compliance with the General Plan and Specific Plan polices will ensure that the impacts on police services are less than significant.

Specific Plan Policies that Reduce Impact

Compliance with the Antioch General Plan and the following proposed Specific Plan policies would ensure that the impact on police services would be less than significant:

UT-25 Ensure that the Antioch Police Department has adequate police staff and equipment to serve the new development in the Hillcrest Station Area.

UT-26 As part of new development applications, require a fiscal impacts analysis related to police services. The analysis must either demonstrate that total estimated tax revenues to the General Fund will pay for the total estimated cost of police services, or propose additional funding sources for ongoing police services to the Hillcrest Station Area.

UT-27 Coordinate with the Antioch Police Department on project site design to increase public safety. Consider lighting and minimizing hiding spots in building and street design.

Mitigation Measures

No mitigation measures are required.

3.12-3 *New development under the proposed Hillcrest Station Area Specific Plan will increase the demand for school facilities. (Less than Significant)*

The General Plan performance objective is the provision of schools in locations that are readily accessible to student populations, along with sufficient facilities to provide educational services without overcrowding. General Plan policies state as follows:

c. Require new development to pay all legally established fees or participate in land-based financing districts established by local school districts for the acquisition and development of school sites with adequate, permanent classroom space, as required by the local school district.

e. Provide incentives in the City's residential growth management program for the provision of developer assistance to local school districts beyond nominally required mitigation fees. The objective of such incentives is that the combination of required fees and incentives provide a full contribution proportional to the needs of the proposed development for all school-related facilities to serve the proposed project.

Implementation of the proposed Plan is estimated to result in an increase in student population in the AUSD of approximately 563 students. Based on the student generation rates, 2,500 new multi-household units would house approximately 250 elementary students, 113 middle school students, and 200 high school students in 2035.

Table 3.12-2 Buildout Projections: Student Enrollment

	2006-2007 Enrollment	2015 Projected Change [1]	Planning Area Students (2035)	Cumulative 2035 Total	Existing Capacity	% Capacity
Elementary	8,708	517	250	9,475	9,175	103%
Middle	4,568	-315	113	4,366	4,540	96%
High	6,410	-1,312	200	5,298	6,615	80%

1. AUSD enrollment projections do not include any residential development (or students) in the Planning Area.

Source: Antioch Unified School District; Dyett and Bhatia, 2008

The school district has estimated that the elementary schools will be at 101 percent capacity in 2015; and the analysis above estimates that elementary schools will be at 103 percent capacity in 2035. The addition of 250 more students from the Planning Area will contribute to the over-crowding. The 2035 projections do not account for growth between 2015 and 2035 that occurs outside the Planning Area. It is foreseeable that Orchard Park School will need to be expanded or an additional elementary school will be needed to serve northeast Antioch and northwest Oakley. AUSD currently has no plans to expand any existing schools or build new ones at this time; however, the AUSD Facilities Master Plan is currently being updated. Existing middle and high school facilities should be adequate to serve anticipated need. Existing General Plan policies, City regulations, and School District policies and fees require that project applicants pay all legally established fees or participate in land-based financing districts for school facilities. Therefore, this impact is less than significant.

Specific Plan Policy that Reduce Impact

Compliance with the Antioch General Plan and the following proposed Specific Plan policy would ensure that the impact on public schools would be less than significant:

UT-28 Require new development to pay all legally established fees or participate in land-based financing districts established by local school districts for the acquisition and development of school sites with adequate, permanent classroom space, as required by the local school district.

UT-29 Prior to approval of any development projects or subdivisions that include residential units, the City and project applicants shall work with the Antioch Unified School District to identify any additional elementary school facilities needed to serve students from the Planning Area. If it is determined that students from the project or subdivision will cause the capacity of the elementary school serving the Hillcrest Station Area to be exceeded, the City and the project sponsor shall work with AUSD to provide the additional required facilities prior to occupancy of the residential units.

Mitigation Measures

No mitigation measures are required.

3.12-4 ***Implementation of the Hillcrest Station Area Specific Plan would result in an increase in the use of existing neighborhood and regional parks and would increase the demand for parkland. (Less than Significant)***

The adopted City standard for public parks is to provide five acres of improved public and/or private neighborhood parks and public community parkland per 1,000 residents, including appropriate recreational facilities.

The Planning Area is intended to be developed with transit-oriented uses to support the public transit investment and provide a new employment center for the City of Antioch. As such, the majority of the development will be compact office and mixed use areas. The Specific Plan's objective is that everyday amenities like parks, neighborhood retail, and public transportation options be within easy walking distance from new homes and offices. Public open space is provided as space for active and passive recreation to create community identity, enhance opportunities for socializing, improve property values, and increase the area's livability and quality of life. Plazas are provided, and will play an important role in the vitality of the Planning Area. East Antioch Creek is preserved and enhanced; and a multi-use trail is provided along the entire length of the Creek. Antioch community members and project stakeholders have prioritized preserving and enhancing East Antioch Creek as part of this planning process.

Based on the City standard, buildout of the proposed Plan will require the addition of approximately 25 acres of new parkland. Open space will be generally provided as illustrated in the proposed Open Space Plan. Parks are required to serve as staging areas to the trail network and to provide recreation facilities for the new residential neighborhoods. Plazas are required along the pedestrian-oriented streets at the center of each Transit Village area and at each eBART station.

One of the major features is a linear park around the existing wetlands, which contains a 2.5 mile multi-use trail loop. A 75 foot buffer is required around the delineated wetlands to preserve the natural processes of stormwater management and biological habitat. The buffer is planned in two parts: a 50-foot wide wetland buffer that is fenced so that people and pets do not adversely impact the wetlands, and a 25-foot wide recreational buffer that contains landscaping and a multi-use trail. The 25-foot portion of the buffer is considered a linear park; and counts towards the park requirements. In order for this to be an attractive amenity, extensive landscaping and improvements will be needed around the trail and in the wetland areas. Development sponsors can apply for park credit to meet a portion of the park requirements by providing appropriate, native landscaping in the wetland buffer area, as approved by the City and a certified wetland biologist. This specialized recreation area will serve the entire Antioch community, not just the residents of the new development within the Planning Area.

In addition to the trail loop, more than 9,000 linear feet of landscape buffer is required in utility easements. Development sponsors may apply to meet a portion of the park requirements by providing trails and passive recreation areas in the landscape buffers. The table below shows the park and open space assumptions used in the proposed Plan:

Table 3.12-3 Proposed Parks and Open Space

Park Type	*Acres*
Linear Park and Trail	8.5
Plazas (2 x 0.5 acre, 2 x 0.25 acre)	1.5
Transit Village	2
Town Center	3
Wetland and Landscaping Buffer Credit	10
Total	**25**

Source: Dyett & Bhatia, 2008.

Specific Plan Policies that Reduce Impact

Compliance with the Antioch General Plan and the following proposed Specific Plan policies would ensure that the impact on existing parks and recreation facilities and maintenance would be less than significant:

OS-1 Prepare parks plans as part of the required Master Plans for the Transit Village and Town Center areas, in order to meet the recreational needs of the residents and employees of the Station Area. The parks components of the Master Plans should fulfill the following criteria:

- An integrated network of public open spaces, parks, plazas, and trails should be created to connect the Transit Village, Town Center, and existing neighborhoods.
- Open space types and locations should be generally consistent with Figure 3-6.
- All new employees and residents should be within a five- to ten-minute walk of a park or plaza.
- For all new public parks, the design, program, and facilities must be approved by the City.

OS-2 Park and open space land must be provided as part of new development. Park dedication requirements will be based on the number of units and size of residential units proposed in an individual development project, following the provisions of the City's ordinances. With City approval, impact fees may be paid in lieu of park dedication for small properties where no parks are shown on the Open Space Plan.

- In the Transit Village area, provide a small neighborhood park approximately two acres in size within walking distance of the residential units. This park could be located adjacent to the East Antioch Creek Linear Park trail.
- In the Town Center area, provide a neighborhood park approximately three acres in size, with at least one sports field.

OS-3 Provide a comprehensive maintenance program for all open spaces, parks, plazas, and landscape buffers. Any parks or open spaces less than five acres in size should be maintained by private property owners, rather than by the City of Antioch, using mechanisms such as Homeowners' Associations (HOAs) or Street Lighting and Landscaping Maintenance Districts (LLMDs).

OS-6 Project sponsors may apply for partial credit of park requirements by improving utility easement landscape buffers with trails, benches, and other recreational amenities.

OS-7 Connect trails and parks to the City's existing trail network.

OS-8 Create a linear public open space at least 25 feet wide around the wetlands and detention basins. Design the open space consistent with the following criteria:

- A multi-use trail 8-12 feet wide is provided around the perimeter of the 50-foot inner wetland buffer area;
- The trail connects to public streets, public parks, and plazas;
- At least two pedestrian and bike paths are available to cross the creek;
- At least one staging area with parking is provided adjacent to the trail in the Transit Village area and one in the Town Center area;
- Recreational facilities, such as seating, picnic tables, tot lots, and exercise areas or par course, are provided adjacent to the trail;
- Viewing platforms may be built to observe the natural areas; and
- If feasible, informational signage is provided so that the riparian habitat can used as an educational destination for local schools.

OS-9 Improve the creek and wetlands so that they are visually attractive, and at the same time protect wildlife habitat, movement corridors, special status species, and stormwater management functions, consistent with the criteria below.

- Any creek, wetland, and wetland buffer improvement must be reviewed and approved by a certified biologist.
- Appropriate types of fencing must be provided between the wetlands and the park areas to ensure that pets and children do not disturb sensitive habitats.
- Plants must be native and appropriate to East Antioch Creek.

OS-10 Development sponsors may apply for credit toward a portion of the park land dedication requirements for creek and wetlands restoration and/or improvements.

OS-11 Improve areas around the detention basins with trails, trees, landscaping, and other amenities so they become an integral and attractive portion of the open space network within the Station Area.

OS-12 Incorporate public plazas in commercial and mixed use development within the pedestrian center areas. Plazas should be designed consistent with the following criteria:

- The size of the plaza is to be commensurate with the size of the development project and the height and scale of the buildings.
- Plazas must be located adjacent to a public street.
- Plazas must be open to the public during all daylight hours.
- Plazas must be located generally adjacent to retail and restaurant uses, rather than primarily office uses.

- Both paved areas and landscaping must be included, and seating and areas for interaction must be provided.
- A variety of flexible seating options (ledges, steps, or movable chairs), water features or art, connectivity to the street, environmental protection, and access to food (food carts or adjacent cafés) must be provided.

Mitigation Measures

No mitigation measures are required.

3.12-5 ***Implementation of the Hillcrest Station Area Specific Plan would result in an increase in demand for community center space. (Less than Significant)***

The adopted City standard is to maintain a minimum of 750 square feet (sf) of community center space per 1,000 residents. Antioch defines community facilities as buildings needed to support daily operations of the City, as well as other buildings designed for community meetings, indoor recreational and instructional programs, and social activities. The proposed Specific Plan policies will ensure that this impact is less than significant.

Specific Plan Policies that Reduce Impact

Compliance with the Antioch General Plan and the following proposed Specific Plan policies would ensure that the impact on community center space would be less than significant:

UT-31 Provide adequate community center space for new residents, either in development projects or through an in-lieu fee.

- Community center space must serve all the residents of the City, and be programmed with activities that meet the unmet needs of the Antioch community.
- Exempt ground floor public community center space from floor area ratio (FAR) limits in mixed-use development projects.

UT-32 Exempt the floor area devoted to daycare and childcare from floor area ratio (FAR) limits in development projects.

Mitigation Measures

No mitigation measures are required.

3.13 Utilities

This Section describes infrastructure conditions and needs for the following utility systems: potable water, wastewater, storm drains, solid waste, oil and gas, and electricity. Water quality and stormwater management is evaluated in Section 3.9 Hydrology.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Potable Water

Potable water supply for the Hillcrest Station Area is provided by the City of Antioch through its municipal water system. The City provides water service to homes, businesses, and industry. The City of Antioch Urban Water Management Plan Update (UWMP) indicates that the system serves about 101,049 people within a 28.8 square mile area. Annually the City provides approximately 7,100 million gallons of water (21,576 acre feet per year) to 28,860 connections. The City currently relies entirely on surface water. Its primary sources are the San Joaquin River and the Delta through water purchased from Contra Costa Water District (CCWD). (City of Antioch, 2006)

Water Use

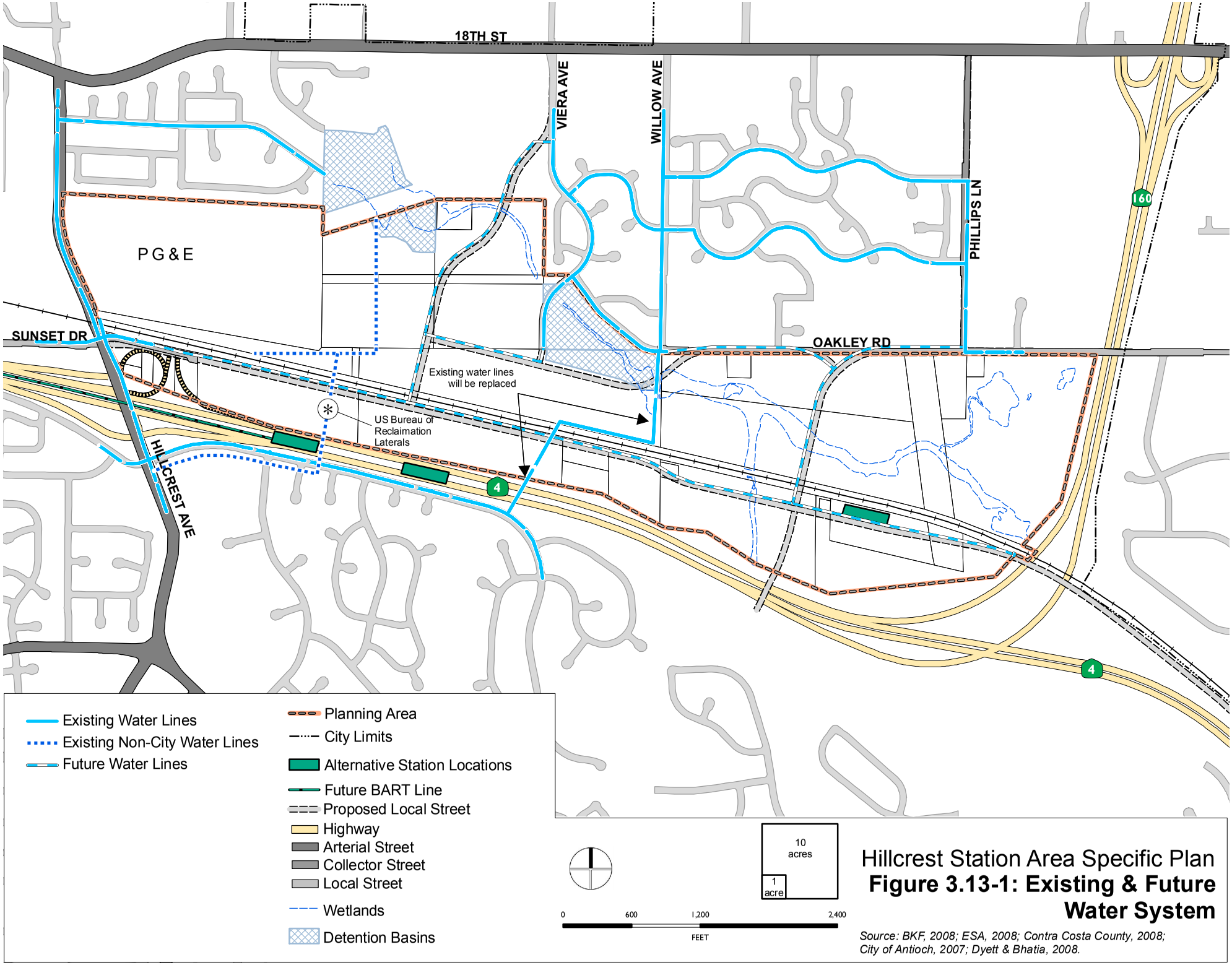
Over the past seven years, average daily water use in Antioch has increased by approximately 10 percent, which is a similar growth rate as population over the same time period.

Table 3.13-1 Historic Average Daily Water Use

Year	*Million Gallons per Day (MGD)*	*Percent Change*
2007	19.08	9%
2006	17.50	-4%
2005	18.25	-5%
2004	19.21	4%
2003	18.46	-1%
2002	18.66	4%
2001	17.89	4%
2000	17.21	

Source: City of Antioch, Public Works Department, 2008; City of Antioch, Urban Water Management Plan Update, 2006

In 2007, single-family homes used the most water, followed by landscape irrigation. The remaining land use types account for less than 20 percent of the annual water use.



Hillcrest Station Area Specific Plan

Figure 3.13-1: Existing & Future Water System

Source: BKF, 2008; ESA, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.

Table 3.13-2 2007 Water Use by Land Use Type

Land Use	*Million Gallons Per Year*	*Percentage*
Single-Family Residential	4,658	65%
Multi-Family Residential	458	6%
Commercial	479	7%
Industrial	273	4%
Landscape Irrigation	1,242	17%
Other	33	<1%
Total	**7,143**	100%

Source: City of Antioch, Public Works Department, 2008

The UWMP includes water use projections based on the 2002 ABAG population projections and water use factors derived from City records. The City will use approximately 25,284 acre feet per year, an estimated 8,400 million gallons per year (an average of approximately 23 mgd) in 2025. This represents about a 21 percent increase over water use in 2007.

Table 3.13-3 Total Annual Water Use Projections

Year	*Million Gallons*	*Acre Feet*
2010	7,300	22,403
2015	7,750	23,784
2020	8,200	25,165
2025	8,400	25,779

Source: City of Antioch, Urban Water Management Plan Update, 2006; Dyett & Bhatia, 2008

Water Supply and Quality

In 2004, the City purchased 15,501 acre feet (74 percent) (5,051 million gallons) from the Contra Costa Water District, and pumped 5,511 acre feet (26 percent) (1,796 million gallons) from the San Joaquin River for a total water supply of 21,012 acre feet (6,847 million gallons). The City has an agreement with the State of California Department of Water Resources that allows a maximum of 10,200 acre feet per year (3,324 million gallons) to be taken from the river. This contract expires in 2008. Historically, the City has pumped an average of only 6,438 acre feet per year (2,098 million gallons), 63 percent of the permitted amount, from the river. The City only withdraws water from the river when salinity levels are sufficiently low.

CCWD is prepared to sell the City all its projected water needs through year 2028, unless constrained by drought conditions. The total available water supply projected for the 2025 is 49,140 acre feet per year (16,012 million gallons). This is almost double the projected water use, which is approximately 26,000 acre feet per year (8,400 million gallons) in 2025. Thus the City will have an adequate water supply during normal, single dry years, and multiple dry years.

The quality of the water in the Contra Costa Canal is dependent on a multitude of factors outside CCWD control. The US Bureau of Reclamation is not required to deliver any specific water

quality level to the Canal. The State Water Resources Control Board (SWRCB) has established water quality standards for the Delta.

The Antioch Water Treatment Plant (WTP), managed by the City of Antioch, produces high-quality drinking water that meets all state and federal primary and secondary standards. The WTP provides conventional treatment/disinfection, flocculation, sedimentation, and filtration to ensue water meets public health standards.

Recycled Water

Delta Diablo Sanitation District (DDSD) supplies the City of Antioch with approximately 530 acre feet (173 million gallons) of tertiary-treated recycled water per year. (City of Antioch, 2006) DDSD began its water recycling program in 2001 in an effort to protect the state's valuable and limited water supply. Recycled water is used at two Calpine power generating plants and for landscape irrigation on lands adjacent to the existing pipeline. A new recycled water pipeline is proposed for construction from the existing recycled water pipeline to several existing and new users in Antioch. The proposed pipeline would provide recycled water to the Lone Tree Golf Course, Fairview Park, Babe Ruth Baseball Fields, Memorial Park, Mountaire Park, Chichibu Park, Antioch Fairgrounds, and the Antioch City Park, and eventually other users such as Live Oak High School and Antioch High School. (RMC Water and Environment, 2006) The new pipeline would not serve the Planning Area and there are no plans to extend recycled water to the Hillcrest Station Area at this time. (Chapman, 2008)

Water Conservation

Contra Costa Water District and the City of Antioch work together to implement an ongoing water conservation program. The overall program is made up of various demand management measures, including: water survey programs for residential connections; residential plumbing retrofit programs which distributes low-flow showerheads, faucet aerators, and toilet leak detection tablets; landscape water budget program for large landscape irrigation accounts; high-efficiency washing machine rebate program; public information programs; school education programs; conservation programs for commercial, institutional, and industrial accounts; conservation pricing; water waste prohibitions; and a residential ultra-low flush toilet replacement program. Additional water conservation measures have been established for water supply shortages.

Water Infrastructure and Treatment Plant

The City of Antioch operates a water treatment, storage, and distribution system which serves the entire City. Raw water is stored in the Municipal Reservoir (735 acre-foot capacity), located adjacent to the Lone Tree Golf Course, and then treated at the Antioch Water Treatment Plant (WTP), located on Putnam Street. The WTP currently has a maximum capacity of 38 million gallons per day (MGD). After treatment, the water is transmitted through a distribution system of 4- to 30-inch diameter pipelines throughout the City. In addition to the Municipal Reservoir and Water Treatment Plant, the City owns and operates 12 storage reservoirs with a combined storage capacity of 25.5 million gallons, eight booster stations, and several backup wells. (City of Antioch, 2006)

Contra Costa Water District also maintains untreated water lines on behalf of the United States Bureau of Reclamation within the Planning Area. Laterals 9.1 and 9.1-1 are located near the

intersection of SR 4 and Hillcrest Avenue. Any impacts to these laterals will require NEPA (National Environmental Policy Act) review and Reclamation approval.

Water Distribution Pipelines Serving the Planning Area

The majority of the Planning Area is in Pressure Zone II, though the southeastern portion of the site is in Pressure Zone III East. In Pressure Zone II, there are four reservoirs with a combined storage capacity of 7.5 million gallons, and two booster stations.

Due to the limited development in the Planning Area, few water mains have been installed. Hillcrest Avenue (20-inch diameter), Viera Avenue (16-inch diameter), Willow Avenue (16-inch diameter), Sunset Drive (10-inch diameter), and portions of Oakley Road (12-inch diameter) have existing water mains. In addition, there are a few pipelines (8-16-inch diameters) which are not built as part of the road network, but serve the existing housing units near the south end of Willow Avenue. The Water System Master Plan Update anticipated the need for new water mains along Oakley Road (12-inch diameter), Phillips Lane (12-inch diameter), along PG&E power transmission rights-of-way, and an east-west link between Hillcrest Avenue and Viera Avenue (20-inch diameter) prior to 2028. (City of Antioch, 1999) The system improvements were planned based on primarily industrial development within the Planning Area.

Wastewater Management

Conveyance and Treatment

Delta Diablo Sanitation District (DDSD) provides sewer treatment service to Antioch, as well as to Pittsburg and Bay Point. The Delta Diablo Sanitation District is also responsible for conveyance of wastewater from City pipelines to interceptor sewers, which convey the sewage to the Bridgehead and Fulton Shipyard (Antioch) pump stations, located in southeast Antioch and at Fulton Shipyard Road, respectively. The wastewater is treated at the DDSD Water Pollution Control Facility (WPCF), located near the border of Antioch and Pittsburg.

DDSD is currently planning WPCF improvements to increase the capacity from 16.5 mgd to approximately 18.0 mgd. New capacity should be operational in March 2010. Capacity improvements are constructed gradually as demand increases, based on the District's master plan. In 2020, DDSD anticipates increasing capacity to 22.5 mgd, and after 2030, capacity is expected to be 24.0 mgd. (Delta Diablo Sanitation District, 2007) Revenues for expansion projects come from Capital Facility Capacity Charges. The fees were evaluated in fiscal year 2005-2006, and new fees were established in 2007.

In 2003, the average annual flow to the WPCF was 14.2 mgd, of which about half comes from the City of Antioch. Approximately 92 percent of the flow is generated from residential sources. Based on per capita projections and the water conservation programs in place in 2003, is it is estimated that average annual flows will increase to 24.0 mgd by 2025. (City of Antioch, 2006) This amount is consistent with the planned WPCF capacity improvements to handle 24.0 mgd by 2030. The full capacity may need to be provided sooner, depending on the actual timing of new growth.

Discharge and Recycled Water

DDSD has a current National Pollutant Discharge Elimination System (NPDES) permit to discharge treated and disinfected secondary effluent into New York Slough in the San Joaquin

Delta. In 2005, 9.25 acre feet were discharged, all of which met the NPDES permit's quality requirements.

In addition to discharging treated wastewater, DDSD diverts a portion of the effluent to the Recycled Water Facility. Approximately 7.0 mgd of recycled water is piped to two power generation centers and two parks in Pittsburg. DDSD and the City of Antioch are exploring the potential to expand recycled water deliveries to users in Antioch.

Municipal Wastewater Collection System

The City is responsible for collection of wastewater and maintenance of local sanitary sewer lines. The City of Antioch's sewer system consists of approximately 282 miles of pipeline ranging from 4-inches to 68-inches in diameter, plus 5,300 manholes, cleanouts, and other access structures. The City of Antioch's wastewater collection system was built beginning in the early 1950's, after the old combined sewer system converted to sanitary sewer system. (Winzler & Kelly, 2003)

The 2003 Wastewater Collection System Master Plan developed future scenarios for capacity analysis, by distributing total population growth and nonresidential land use expansion to General Plan focus areas. The distribution of growth was based on existing land use designation, total area of the focus area, current population, and the areas of developed non-residential parcels. Table 3.13-4 contains the estimated wastewater flow for the City of Antioch as estimated in 2003, based on the land uses in the General Plan.

Table 3.13-4 Master Plan Design Flow Scenarios Summary

Design Flow Scenario	*2002*	*2007*	*2012*	*2020*	*2020**
Total Wastewater Flow from south Antioch through Bridgehead Pump Station (MGD)					
Average Dry Weather Flow	2.6	3.7	4.8	6.0	8.1
Peak Dry Weather Flow	4.4	6.3	8.3	10.4	14.4
Peak Wet Weather Flow with 5-year Storm	7.2	9.7	12.3	15.0	19.9
Peak Wet Weather Flow with 25-year Storm	8.2	10.9	13.7	16.4	21.9
Peak Wet Weather Flow with 100-year Storm	9.5	12.4	15.4	18.5	24.4
Total Wastewater Flow from Other Parts of the City (MGD)					
Average Dry Weather Flow	5.1	5.8	6.3	6.8	6.8
Peak Dry Weather Flow	9.6	10.3	11.2	12.1	12.2
Peak Wet Weather Flow with 5-year Storm	12.7	13.7	14.6	15.6	15.7
Peak Wet Weather Flow with 25-year Storm	13.2	14.1	15.2	16.1	16.3
Peak Wet Weather Flow with 100-year Storm	13.9	14.9	15.9	16.9	17.1
Total Wastewater Flow from City of Antioch (MGD)					
Average Dry Weather Flow	7.7	9.6	11.2	12.8	14.9
Peak Dry Weather Flow	13.9	16.7	19.5	22.5	26.6
Peak Wet Weather Flow with 5-year Storm	19.9	23.3	26.9	30.5	35.6
Peak Wet Weather Flow with 25-year Storm	21.4	25.0	28.8	32.5	38.2
Peak Wet Weather Flow with 100-year Storm	23.3	27.3	31.3	35.4	41.5

* Includes Roddy Ranch and Ginochio future urban areas. Roddy Ranch has been annexed. Only a portion, about 200 acres, of the Ginochio urban area has been annexed.

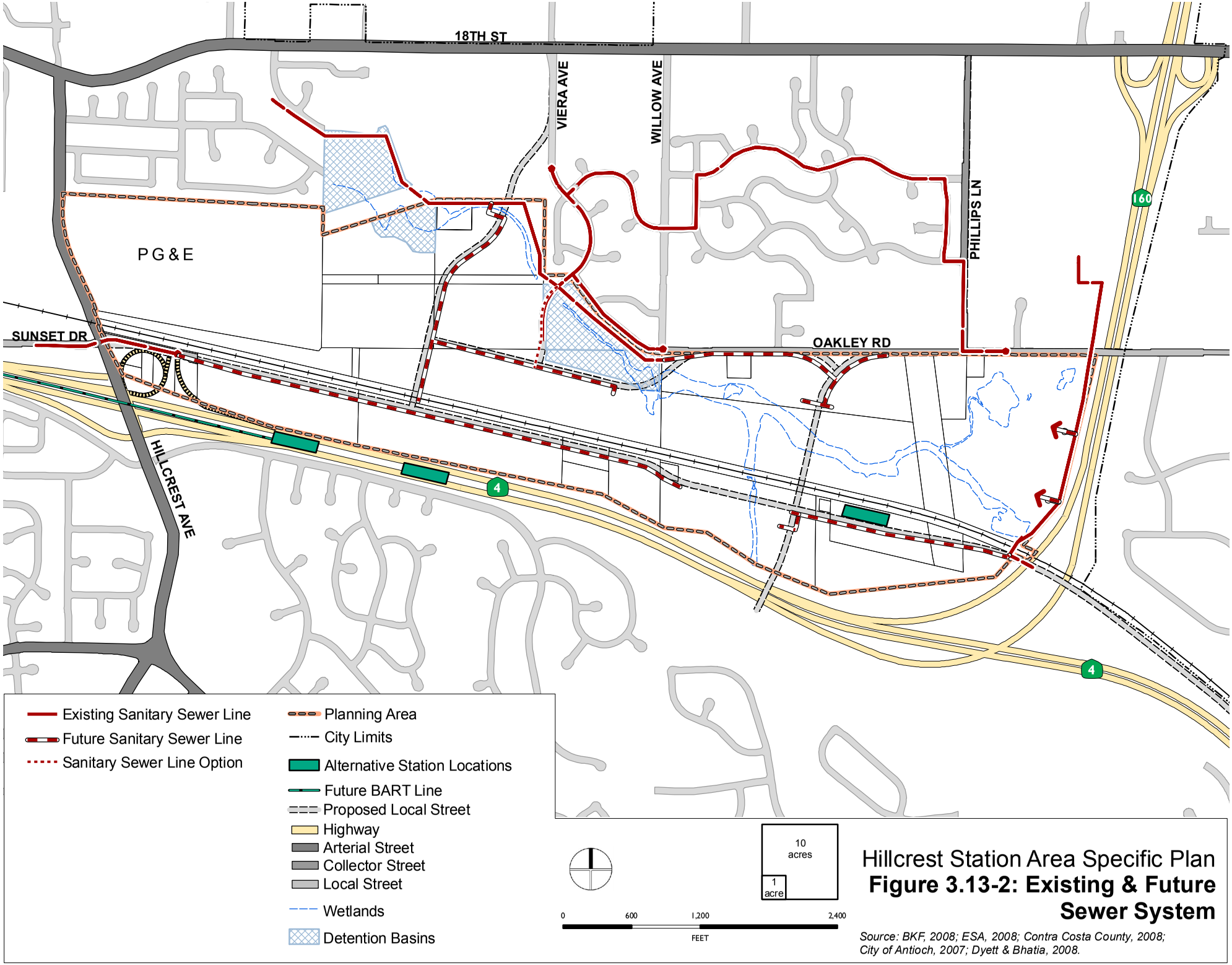
Source: Winzler & Kelly, Wastewater Collection System Master Plan, 2003.

The City of Antioch Wastewater Collection System Master Plan compares the total flows through the DDSD pump stations with the estimated flows in the DDSD Conveyance System Master Plan. The comparison shows that the flow estimates agree with DDSD's estimates except for peak wet weather flow. The deviation is due to different definitions of peak wet weather flow in the two studies. The City of Antioch Master Plan includes peak base wastewater flow (BWF) in the peak wet weather flow calculation while DDSD uses average BWF for their peak wet weather flow estimates, as shown in Table 3.13-5.

Table 3.13-5 DDSD Master Plan Data and City of Antioch Master Plan Data

	Peak Dry Weather Flow (MGD)		*Peak Wet Weather Flow (MGD)*	
Location	*DDSD*	*Antioch*	*DDSD*	*Antioch*
Bridgehead Pump Station (from south Antioch through Bridgehead Pump Station)	10.5	10.4	9.7	15
Fulton Shipyard Pump Station (from other parts of Antioch)	12.8	12.1	13.9	15.6

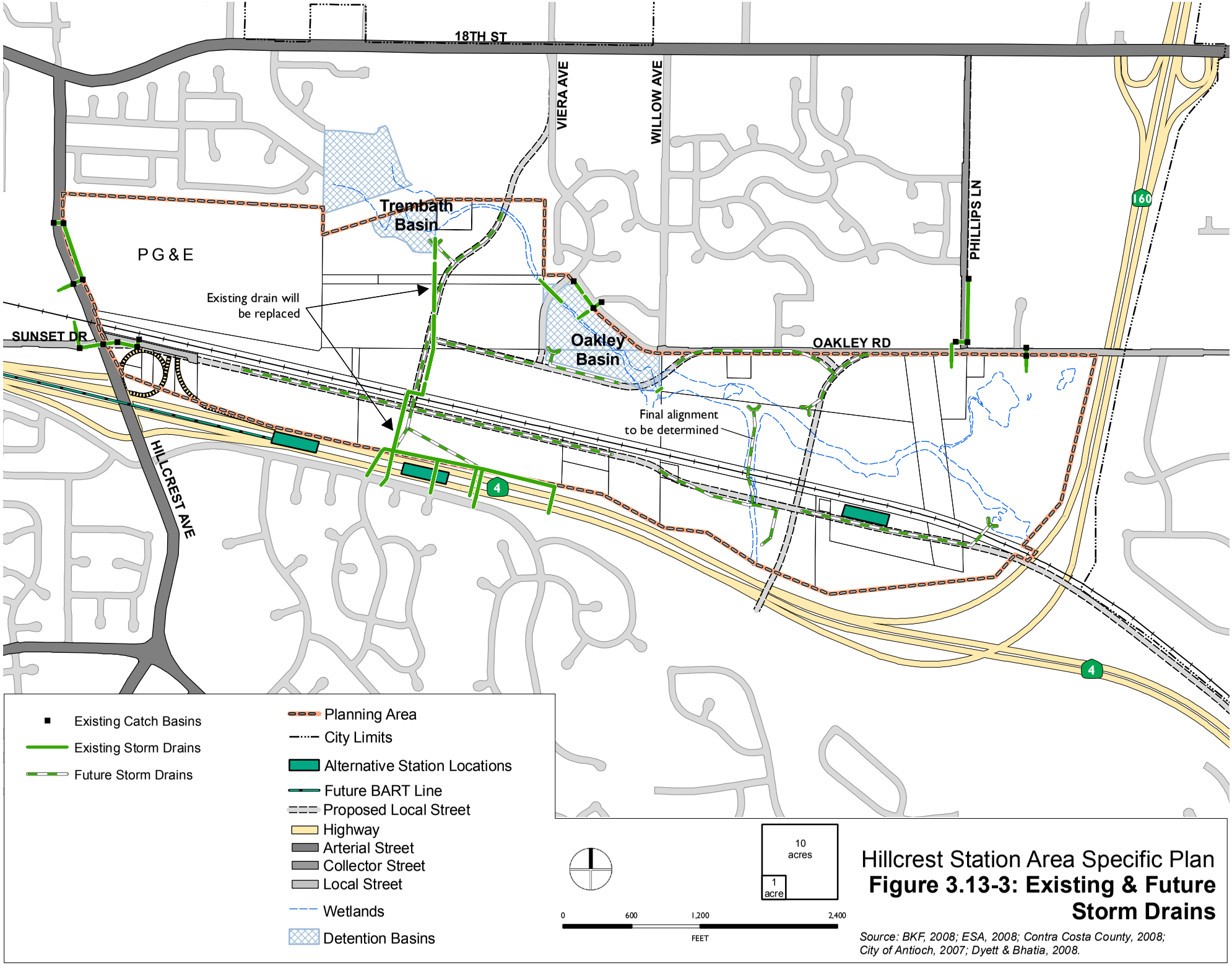
Source: Winzler & Kelly, Wastewater Collection System Master Plan, 2003.



Hillcrest Station Area Specific Plan

Figure 3.13-2: Existing & Future Sewer System

Source: BKF, 2008; ESA, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.



Hillcrest Station Area Specific Plan

Figure 3.13-3: Existing & Future Storm Drains

Source: BKF, 2008; ESA, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.

The existing sewer lines near the Planning Area were installed post-1960, with rubber compression joints for better leakage protection. Due to the lack of development within the Hillcrest Station Area, there is limited sewer service in the Planning Area. Sewer lines serve the adjacent neighborhoods to the north. These pipes flow to the Fulton Shipyard (Antioch) Pump Station. No improvements were recommended for this pipeline in the 2003 Wastewater Collection System Master Plan. In addition, there is a sewer mainline that parallels the eastern edge of the Planning Area, which collects wastewater from the southern part of the City and transports it to the Bridgehead Pump Station. The 2003 Master Plan recommended that 3,567 feet of this pipeline starting at the Union Pacific Railroad north to East 18th Street be upgraded to help serve development in the southern part of the City.

Storm Drainage Conveyance

The City of Antioch owns and maintains systems of street gutters, more than 110 miles of underground pipes, catch basins, storm channels, culverts, and ditches that handle urban runoff before conveying it to channels owned and maintained by the City and the Contra Costa Flood Control and Water Conservation District (CCCFCWCD). The channels eventually release stormwater to the San Joaquin River. Within the Station Area, the majority of stormwater is conveyed from surrounding development via several existing mains to East Antioch Creek and the two detention basins in the Planning Area, Oakley and Trembath. Maintenance fees for the system are collected by the City through the Contra Costa County Clean Water Program. Potential impacts to the detention basins are addressed in Section 3.9 Hydrology and Water Quality.

Solid Waste

Pleasant Hill Bayshore Disposal currently provides solid waste collection, disposal, recycling, and yard waste services to the City through a franchise agreement. Solid waste and recyclables from Antioch are taken to the Contra Costa Transfer and Recovery Station located in Martinez, where recyclables are separated out and stored before shipment to recycling markets. Solid waste is transferred from the transfer station to the Keller Canyon Landfill in Pittsburg. The landfill has a permitted lifetime site capacity of 64 million cubic yards, although the actual site capacity is estimated at over 70.2 million cubic yards. The operators of the landfill estimate its life span to be beyond 2060, even accounting for expected growth throughout Contra Costa County. The landfill serves the entire County, and accepts all general refuse, construction debris (including concrete, soil, and roofing materials), appliances, and tires, but no hazardous, flammable, or special wastes.

Pleasant Hill Bayshore Disposal, Contra Costa Transfer & Recovery, and the Keller Canyon Landfill Company are wholly-owned subsidiaries of Allied Waste Industries, forming a vertically integrated solid waste and recyclables collection and disposal operation serving residential and commercial customers in Contra Costa and Solano Counties.

The City disposed of 80,765 tons of solid waste in 1998. Households generated 40 percent, and businesses generated 60 percent of the total solid waste. In 2005 the City disposed of 91,414 tons of solid waste, of which the households generated 40 percent and businesses 60 percent. (CIWMB, 2008) As of 2005 and 2006, the City of Antioch has been in compliance of the state-mandated solid waste diversion targets (50 percent of all solid waste must be diverted from the landfill through recycling, composting, or other reuse efforts.)

Electricity and Gas

Pacific Gas & Electric provides electricity and natural gas to the Planning Area. PG&E does not foresee any issues meeting the gas and electricity needs for the development area. In addition, PG&E owns two gas distribution pipelines that run from the Hillcrest Substation along the northwestern border of the Planning Area under the electricity transmission towers and line.

The Hillcrest Yard and Substation site serves as a 230 kV substation and construction yard, and houses the local engineering department. At this time, between 60 and 70 employees work on the site. PG&E currently has no major capital improvement projects planned on the substation site.

PG&E electrical transmission and distribution lines criss-cross the Planning Area. Large towers (between 80 and 100 feet tall) supporting 230 kV lines run approximately north-south at both the east and west ends of the Planning Area. PG&E owns a 200-foot wide parcel for the lines and towers at the east end of the Planning Area. This right-of-way was reserved for an additional line in the future. The second 230 kV line crosses SR 4 to the substation in the western portion of the Planning Area. PG&E maintains a 175 foot easement on the Parachini property for this line. This line exits the substation's northeast corner where PG&E owns the right-of-way.

Distribution lines, typically 12 and 21 kV, extend east-west near Oakley Road, across Oakley Detention Basin to the substation. PG&E and County Flood Control will need to work together to move or raise one of the transmission towers when the detention basins are expanded and improved. Another set of distribution lines extend north-south from Oakley Road to the PDQ Products property.

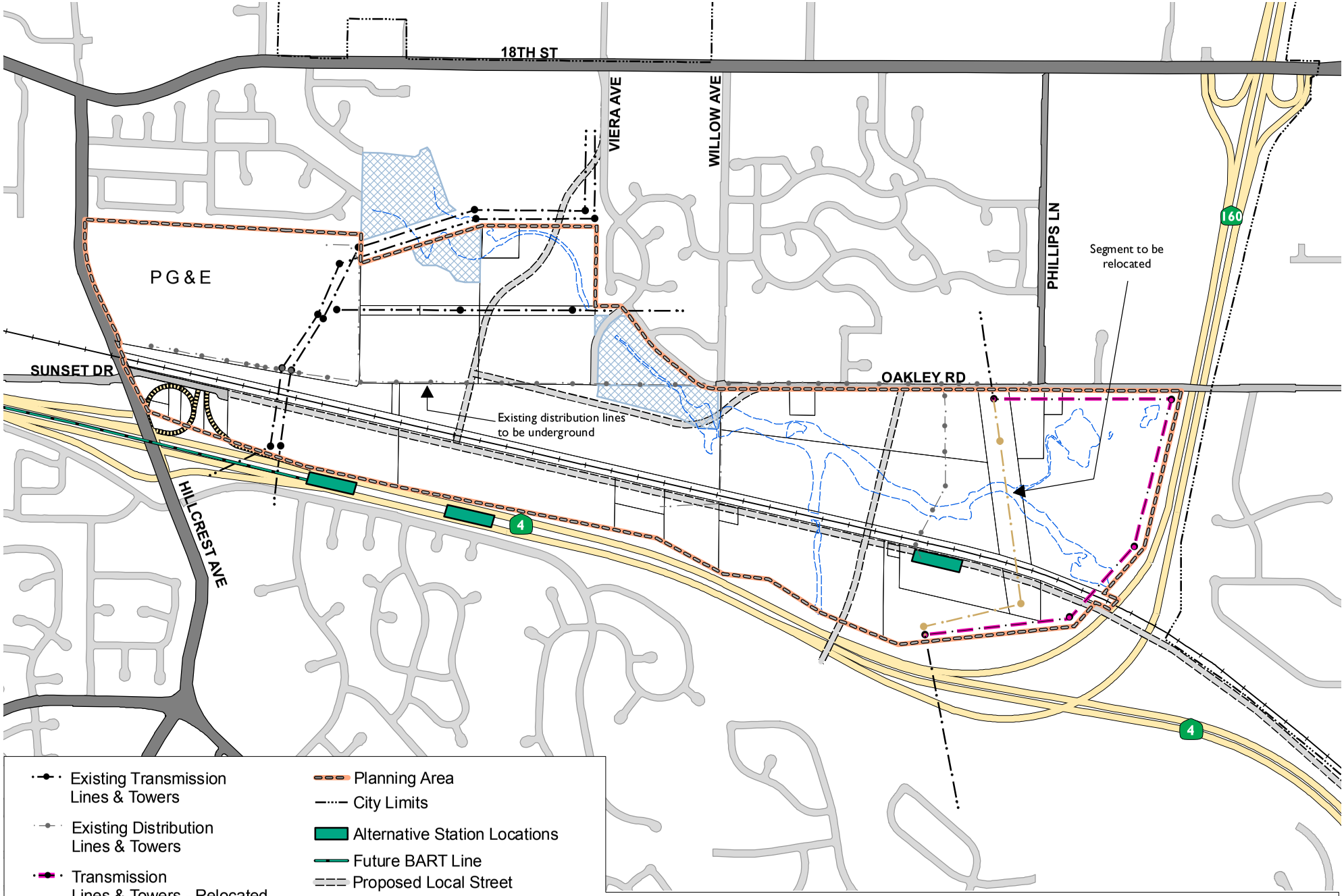
Gas and Oil Pipeline Easements

In the early 1900s, Chevron's predecessors built the Tidewater Associated (TAOC) and Old Valley (OVP) pipelines to transport heavy crude oil and Bunker C fuel oils from the oilfields in Kern County to its Richmond refinery located in Richmond, California. The pipelines were operated until the early 1970s when they were emptied, cleaned, and decommissioned. The pipelines are no longer active and the bulk of the pipe has already been removed. The TAOC pipelines were parallel to the railroad right-of-way. (Mansholt, 2008)

Chevron operates one active pipeline near the Union Pacific right-of-way. This 8-inch steel high pressure pipeline transports refined petroleum products. In addition, Chevron operates a scraper trap/block valve site on parcel APN: 052-052-008. Impacts related to high-pressure pipelines are addressed in Section 3.8 Hazardous Materials and Safety. PG&E operates natural gas pipelines in parcel APN: 051-170-010 to the north of the Planning Area and adjacent to Viera Avenue.

Telecommunications

Pacific Bell is the primary provider of residential and commercial telephone service in the City. Pacific Bell also provides or hosts a variety of telecommunication services such as Digital Subscriber Lines (DSL), Internet Service Providers (ISP), web hosting, virtual private networking, and wireless/cellular paging services. AT&T and Sprint are also an internet Service Providers (ISP) in the City. The City of Antioch negotiates franchises with both ISP and cable television providers and requires that their coverage includes the entire City. Fiber optic networks in the City have been installed by Pacific Bell and AT&T. These networks are privately owned and maintained.



Hillcrest Station Area Specific Plan

Figure 3.13-4: Existing & Relocated Electrical Lines

Source: BKF, 2008; ESA, 2008; Contra Costa County, 2008; City of Antioch, 2007; Dyett & Bhatia, 2008.

The California Public Utilities Commission (CPUC) requires that telecommunications companies anticipate and serve new growth. To meet this new requirement, Pacific Bell continually upgrades their facilities and infrastructure; adding new facilities and technology to remain in conformance with CPUC tariffs and to serve customer demand in the City.

Any additions to City infrastructure, zoning changes, or growth would cause a need for expansion or changes in Pacific Bell's infrastructure. Expansion of Pacific Bell's infrastructure involves finding suitable sites to place equipment. Suitable sites must meet requirements for the physical transmission of telecommunication services and conform to the City's guidelines. Pacific Bell also works with the City to ensure that construction of new facilities does not interfere with any new or newly paved streets.

REGULATORY SETTING

Utilities are not regulated as a whole, but rather different utilities are subject to different local, state, or federal regulations. This section provides a brief overview of the regulatory setting for each of the utilities serving the Hillcrest Station Area.

Federal Regulations

Water

Clean Water Act. The Clean Water Act is the principal federal law that addresses water quality. The primary objectives include the regulation of pollutant discharges to surface water, financial assistance for public wastewater treatment systems, technology development, and non-point source pollution prevention programs. The Clean Water Act also requires that states adopt water quality standards to protect public health and welfare and enhance the quality of water.

Safe Drinking Water Act. The Safe Drinking Water Act (SDWA), administered by the U.S. EPA in coordination with the states, is the main federal law that ensures the quality of drinking water. Under the SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The Department of Public Health administers the regulations contained in the Act in the State of California.

Solid Waste

Resource Conservation and Recovery Act (Amended 1986). The Resource Conservation and Recovery Act is a federal act regulating the potential health and environmental problems associated with solid waste hazards and non-hazardous wastes. Specific regulations addressing solid waste issues are contained in Title 40, Code of Federal Regulations.

State Regulations

Water

California Water Code. California Water Code (Porter-Cologne Act) establishes a program to protect water quality and beneficial uses of state water resources and includes groundwater and surface water. The State Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs) are the principal state agencies responsible for control of water quality.

California Department of Public Health. A major component of the State Department of Public Health, Division of Drinking Water and Environmental Management, is the Drinking Water Program which regulates public water systems. Regulatory responsibilities include the enforcement of the federal and state Safe Drinking Water Acts, the regulatory oversight of public water systems, issuance of water treatment permits, and certification of drinking water treatment and distribution operators. State regulations for potable water are contained primarily within Titles 22 and 17, Chapter 5 of the California Code of Regulations.

The regulations governing recycled water are found in a combination of sources including the Health and Safety Code, Water Code, and Titles 22 and 17 of the California Code of Regulations. Issues related to treatment and distribution of recycled water are generally under the influence of the RWQCB, while issues related to use and quality of recycled water are the responsibility of the California Department of Public Health.

California Environmental Quality Act, SB 610, and SB 221. Section 15083.5 of the CEQA Guidelines requires the City to request certain information from the public water supply system(s) serving the planning area. This requested information includes: an indication of whether the projected water demand associated with the proposed general plan was included in its last urban water management plan; and, an assessment for any major development projects "whether its total projected water supplies available during normal, single-dry, and multiple-dry water years as included in the 20-year projection contained in its urban water management plan will meet the projected water demand associated with the proposed project, in addition to the system's existing and planned future uses."

Senate Bill 610 became effective January 1, 2002, and requires cities in connection with CEQA review to consider water supply assessments to determine whether projected water supplies can meet the project's anticipated water demand. SB 610 also requires additional factors to be considered in the preparation of urban water management plans and water supply assessments.

SB 610 and CEQA Guidelines Section 15083.5 identifies those projects generally as a residential development of more than 500 dwelling units; a commercial or industrial business employing more than 1,000 persons; or any other project that would have a water demand at least equal to a 500 dwelling unit project. SB 221 contains similar provisions as SB 610 but is intended for use with large residential subdivisions and is usually required at the time of tentative tract map approval.

Solid Waste

California Integrated Waste Management Board. The California Integrated Waste Management Board (CIWMB) establishes the statewide regulations for solid waste collection and disposal, including state-mandated diversion goals. Regulations authored by CIWMB (Title 14) were integrated with related regulations adopted by the State Water Resources Control Board pertaining to landfills (Title 23, Chapter 15) to form Title 27 of the California Code of Regulations.

The California Integrated Waste Management Act, AB 939 mandated that all jurisdictions in the State divert at least 50 percent by 2000 through source reduction, composting, and recycling activities. The Act gives the highest priority to source reduction and defines it as the act of reducing the amount of solid waste generated in the first place. Recycling and composting are

given the next highest priority. The Act specifies that all other waste that is not diverted be properly and safely disposed of in a landfill or through incineration. The California Integrated Waste Management Act also mandates that each jurisdiction adopt a Source Reduction and Recycling Element (SRRE) which specifies how the community will meet the 50 percent goals set forth in the Act. Each community is also required to take measures to reduce solid waste generation and to provide for the safe disposal of special and hazardous wastes.

The Solid Waste Disposal Measurement System Act of 2008, SB 1016, amended the California Integrated Waste Management Act procedures for measuring and reporting diversion requirements. Starting in 2009, jurisdictions are required to calculate the 50 percent diversion requirement in a per capita disposal rate equivalent. CIWMB will determine the per capita disposal rate equivalent for each jurisdiction.

Gas and Electricity

California Public Utilities Commission. The California Public Utilities Commission (CPUC) regulates Investor-Owned Utilities (IOUs) including those that offer electric, natural gas, steam, and petroleum service to consumers. The CPUC regulates both electric and natural gas rates and services provided by these utilities including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing. Natural gas regulations are found in General Orders 58, 94, 96, and 112, while electrical distribution regulations are found in General Orders 95, 128, 131, 165, and 166.

Regional and Local Regulations

The San Francisco Bay Regional Water Quality Control Board (RWQCB) governs many of the regulations associated with utilities, specifically potable water, sanitary sewers, storm drains, and recycled water.

Water

RWQCB has the authority to enforce water quality regulations found in the Clean Water Act based on the Porter-Cologne Water Quality Control Act. Issues related to treatment and distribution of recycled water are generally under the influence of the RWQCB, while issues related to use and quality of recycled water are the responsibility of the California Department of Public Health.

City of Antioch, Urban Water Management Plan Update, Final Report, January 2006. The City of Antioch's Urban Water Management Plan (UWMP) documents the City's planning activities to ensure adequate water supplies to meet existing and future demands for water. The UWMP presents forecasted supplies and demands, describes the District's conservation programs, and identifies recycled water opportunities to the year 2030. The UWMP also includes a water shortage contingency analysis and a description of the plan adoption, public coordination, and planning coordination activities.

City of Antioch, Water System Master Plan Update, September 1999. The Public Works Department uses the Master Plan as the basis for projecting water demand and infrastructure capacity improvements. The document also includes the minimum system requirements for equalization, fire flow, and emergencies based on 2028 projections.

The Antioch Municipal Code contains regulations related to the water system in Title 6, Chapter 5. The Subdivision Ordinance contains the specific water pipelines system requirements for development projects.

Wastewater

The RWQCB administers regulations related to wastewater discharges under the Federal Water Pollution Control Act of 1972, as amended, more commonly known as the Clean Water Act. Wastewater discharges are guided by NPDES (National Pollutant Discharge Elimination System) permits granted by the RWQCB. The Antioch Municipal Code contains regulations related to the sewer system, including sewage disposal and service fees, in Title 6, Chapter 4. The Subdivision Ordinance contains the specific sanitary sewer system requirements for development projects.

Storm Drains

The City's storm drain outfalls operate under NPDES permits granted by the RWQCB. The Antioch Municipal Code contains regulations related to stormwater management in Title 6, Chapter 9. The Subdivision Ordinance contains the specific drainage requirements for development projects.

Solid Waste

The CIWMB delegates local permitting, enforcement, and inspection responsibilities to Local Enforcement Agencies (LEA). The Antioch Municipal Code contains regulations related to solid waste and recycling, including construction and demolition debris recycling, in Title 6, Chapter 3.

Antioch General Plan

Water

3.5.4.2 Performance Standard

Adequate fire flow as established by the Contra Costa County Fire Protection District, along with sufficient storage for emergency and drought situations and to maintain adequate service pressures.

8.4.2 Water Facilities Policies

a. As part of the design of water systems, provide adequate pumping and storage capacity for both drought and emergency conditions, as well as the ability to provide fire flows required by the Contra Costa County Fire Protection District.

b. Ensure that adequate infrastructure is in place and operational prior to occupancy or new development, such that (1) new development will not negatively impact the performance of water facilities serving existing developed areas, and (2) the performance standards set forth in the Growth Management Element will continue to be met.

c. Maintain an up-to-date master plan of water facilities.

d. Maintain existing levels of water service by protecting and improving infrastructure, replacing water mains and pumping facilities as necessary, and improving the efficiency of water transmission facilities.

e. Permit the construction of interim facilities only when it is found that construction of such facilities will not impair the financing or timely construction of master planned facilities.

f. Periodically evaluate local water consumption patterns, the adequacy of existing facilities, and the need for new facilities, including this information in the comparison of proposed development projects to the performance standards of the Growth Management Element.

g. Incorporate expected reductions in the need for water facilities resulting from water conservation programs only after several years of experience with the implementation of such programs.

h. Provide the Contra Costa Water District with timely information on development proposals and projected levels of future growth so that it can maintain appropriate long-term master plans and refine the delivery of service and facilities to maintain the performance standards set

10.7.2 Water Resources Policies

Water Supply

a. As part of the implementing the City's residential growth management program and its development review process for non-residential development, ensure that adequate long-term water supplies are available to serve the development being granted new allocations, including consideration of peak drought and peak fire fighting needs.

b. Require new development to be equipped with drought tolerant landscaping and water conservation devices.

c. Work with Delta Diablo Sanitation District to make reclaimed wastewater available for irrigation use. Where reclaimed wastewater can be made available at a reasonable cost, require the installation of dual water systems in development projects and public facilities, using reclaimed wastewater for irrigation.

d. Protect, where possible, groundwater recharge areas, including protection of stream sides from urban encroachment.

e. Oppose proposals with the potential to increase the salinity of the Delta and/or endanger the City's rights to divert water from the San Joaquin River.

Water Quality

f. Participate in the Contra Costa Clean Water program to reduce storm water pollution and protect the water quality of the City's waterways.

g. Require public and private development projects to be in compliance with applicable national Pollution Discharge Elimination System (NPDES) permit requirements, and require the implementation of best management practices to minimize erosion and sedimentation resulting from new development.

h. Participate in regional watershed planning efforts to enhance area water quality.

i. Design drainage within urban areas to avoid runoff from landscaped areas and impervious surfaces from carrying pesticides, fertilizers, and urban and other contaminants into natural streams.

Wastewater

3.5.5.2 Performance Standards

a. Sanitary Sewers (except for force mains) will exhibit unrestricted flow in normal and peak flows.

b. Prior to approval of discretionary development projects, require written verification from the Delta Diablo Sanitation District that the proposed project will not cause the rated capacity of treatment facilities to be exceeded during normal or peak flows.

8.5.2 Wastewater Management Policies

a. As part of the design of sewer systems, provide adequate capacity for average and peak conditions.

b. Ensure that adequate infrastructure is in place and operational prior to occupancy of new development; such that new development will (1) not negatively impact the performance of sewer facilities serving existing developed areas, and (2) the performance standards set forth in the Growth Management Element will continue to be met.

c. Maintain an up-to-date master plan of sewer facilities.

d. Continue to facilitate economically feasible water conservation programs as a means of reducing sewage generation and the need for expanding sewage treatment capacity.

e. Work with Delta Diablo Sanitation District to explore and develop uses for treated wastewater. Where reclaimed wastewater can be economically delivered, require the installation of dual water systems permitting the use of reclaimed water supplies for irrigation purposes and industrial purposes.

f. Incorporate expected reductions in sewage flow projections and the need for sewage treatment capacity resulting from water conservation programs only after several years of experience with the implementation of such programs.

g. Permit the construction of interim facilities only when it is found that construction of such facilities will not impair the financing or timely construction of master planned facilities.

h. Periodically evaluate local sewage generation patterns, the adequacy of existing facilities, and the need for new facilities, including this information in the comparison of proposed development projects to the performance standards of the Growth Management Element.

i. Provide the Delta Diablo Sanitary District with timely information on development proposals and projected levels of future growth so that it can maintain appropriate long-term master plans and refine the delivery of service and facilities to maintain the performance standards set forth in the Growth Management Element.

j. Work cooperatively with affected agencies to ensure that capacity allocations are adjusted among the agencies swerved by Delta Diablo Sanitation District to optimize plant utilization, avoid unnecessary expansions, and facilitate needed expansions.

Storm Drainage System

8.7.2 Storm Drainage and Flood Control Policies

a. Continue working with the Contra Costa County Flood Control District to ensure that runoff from new development is adequately handled.

b. Require adequate infrastructure to be in place and operational prior to occupancy of new development, such that:

- new development will not negatively impact the performance of storm drain facilities serving existing developed areas and

- the performance standards set forth in the Growth Management Element will continue to be met.

c. Design flood control within existing creek areas to maximize protection of existing natural settings and habitat.

d. Provide retention basins in recreation areas where feasible to reduce increases in the amount of runoff resulting from new development.

e. Require new developments to provide erosion and sedimentation control measures to maintain the capacity of area storm drains and protect water quality.

f. Require implementation of Best Management Practices in the design of drainage systems to reduce discharge of non-point source pollutants originating in streets, parking lots, paved industrial work areas, and open spaces involved with pesticide applications.

Solid Waste

8.6.2 Solid Waste Management Policies

a. Continue contracting for garbage and recycling collection services.

b. Require provision of attractive, convenient recycling bins and trash enclosures in new residential and non-residential development.

c. Provide and promote opportunities to reduce solid waste generation at home and in businesses and public facilities, making possible the safe disposal of hazardous materials.

d. Require builders to incorporate interior and exterior storage areas for recyclables into new commercial, industrial, and public buildings.

e. Consider the use of co-generation at appropriate facilities.

f. Support the identification and selection of new landfill sites in remote locations of the County outside of and not requiring access through the Antioch Planning Area, where such sites would not impact existing or proposed parks or water storage facilities.

g. Limit the location of solid waste transfer stations to areas where heavy industrial uses would be appropriate, avoiding traffic, odor, and other environmental impacts on the community.

h. The City of Antioch shall follow State regulations in implementing the goals, policies, and programs in order to achieve and maintain a 50 percent reduction in solid waste disposal through source reduction, reuse, recycling, and composting.

j. The City shall require all development projects to coordinate with appropriate departments and/or agencies to ensure that there is adequate waste disposal capacity to meet the waste disposal requirements of the project, and the City shall recommend that all development projects incorporate measures to promote waste reduction, reuse, recycling, and composting.

Electricity and Gas

10.8.2 Energy Resource Policies

a. Continue to implement Title 24 of the State Building Code, and provide incentives to encourage architects and builders to exceed the energy efficiency standards of Title 24 through increased use of passive, solar design and day-lighting.

b. Promote the use of site design, landscaping, and solar orientation to decrease the need for summer cooling and winter heating.

c. Where feasible, incorporate recycled materials in new construction.

d. Encourage the installation of energy-efficient lighting, reduced thermostat settings, and elimination of unnecessary lighting in public facilities.

e. Facilitate the installation of environmentally acceptable forms of distributed generation, where such systems can be safely and economically provided.

f. Maintain City physical facilities so as to ensure that optimum energy conservation is achieved.

g. Promote purchasing of energy-efficient equipment based on a fair return on investment, and use energy-savings estimates as one basis for purchasing decisions for major energy-using devices

h. Promote coordination of new public facilities with transit services and non-motorized transportation facilities, including bicycles, and design structures to enhance transit, bicycle, and pedestrian use.

i. The City shall review all development plans prior to approval to guarantee that energy conservation and efficiency standards of Title 24 are met and are incorporated into the design of the future proposed project

Telecommunications

6.3.5 Commercial and Industrial Land Availability Policies

c. Promote the establishment of workplace alternatives, including home occupations and telecommuting.

- Promote the provision of high-speed telecommunications cabling in new residential development.

e. Require the provision of fiber optic networks and other advanced telecommunications in new employment-generating developments.

Antioch Municipal Code

Section 6-3.02

The Antioch Municipal Code requires all commercial and residential owners or managers to provide and keep at all times an adequate level of service including solid waste, green waste, and recycling collection for all materials produced or accumulated on the premises. In addition, all construction, demolition, and renovation projects (including tenant improvements) within the city, which are projected to cost more than $75,000 or are sponsored by the city or redevelopment agency, must submit a waste management plan (WMP) which demonstrates that 50 percent of all construction and demolition debris materials have been diverted. All other projects shall be encouraged to divert as much project-related construction and demolition debris as possible.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact on public utilities if the Plan would:

- Have insufficient water supplies available to serve the project from existing entitlements and resources, or require new or expanded entitlements.
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.
- Comply with federal, state, and local statutes and regulations related to solid waste.
- Substantially increase reliance on natural gas and oil, or substantially decrease reliance on renewable energy sources, thereby resulting in wasteful, inefficient, and unnecessary consumption of energy.
- Have an adverse effect on local and regional energy supplies and/or on requirements for additional capacity.

METHODOLOGY AND ASSUMPTIONS

This EIR addresses impacts to the backbone infrastructure affected by the proposed Specific Plan at the program level. Subsequent CEQA review at the project level may be required to determine whether significant environmental effects would result from the construction of infrastructure systems on development sites for water distribution lines, wastewater collection system components, storm drainage conveyance pipes, and any onsite storage or pumping facilities. Project-level review will occur when proposed development plans for the infrastructure facilities are prepared.

Water

The UWMP developed unit water use factors to estimate future water demand. These factors are used to plan for total capacity of the water treatment plant. For programmatic planning, the City uses 190 gallons of water per capita per day as the unit water use factor. This factor is used to estimate the water demand for the development contained in the proposed Specific Plan.

Wastewater

City of Antioch uses average base wastewater flows to plan for pipeline design. These factors were used to estimate total wastewater flow from the projected Specific Plan development. More specific criteria will need to be used to determine the exact pipeline design for the Planning Area.

Table 3.13-6 Base Wastewater Unit Flow Factors

	BWF Unit Flow Factor	
Land Use Category	*gpd/acre*	*gpd/capita*
ER – Estate Residential	-	140
LDR – Low Density Residential	-	140
MLDR – Medium Low Density Residential	-	75
MDR / MU – Medium Density Residential/Mixed Use	-	70
HDR – High Density Residential	-	55
MU – Mixed Use	400*	70**
PI – Public Institutional	400	15 – 22.5 ***
OS – Open Space	1	-
CR - Commercial Retail	300	-
CO – Commercial Office	700	-
CS – Commercial Services	1000	-
CN – Commercial Neighborhood	1000	-
CC - Commercial Convenience	900	-
IH – Heavy Industrial	400	-
BP – Business Park	600	-
IL – Light Industrial	500	-

* Commercial / Industrial area

** Residential area

*** gpd/student for schools

Source: Winzler & Kelly, 2003.

The City also uses the following peaking factors to estimate necessary pipe capacity:

Table 3.13-7 Peaking Factors

Land Use	*Peaking Factor*
Residential	1.7
Commercial	2
Industrial	2
School	2.4

Source: Winzler & Kelly, 2003.

SUMMARY OF IMPACTS

All of the impacts expected to occur as a result of the proposed project will be less than significant after Specific Plan policies are implemented. Cumulative growth in the City of Antioch is anticipated to be consistent with current population and employment projections. (ABAG 2007).

Potable Water

Based on available water supply from the Contra Costa Water District, the City will have an adequate water supply during normal, single dry years, and multiple dry years. The water treatment plant will have sufficient capacity to treat the future water demand for the City. The potable water distribution system will need to be expanded to serve development in the Planning Area. Specific Plan policies prioritize water conservation in new development, and the impact to the existing and future water system will be less than significant.

Stormwater Management System

New storm drainage mains will be located within the backbone street alignments in order to convey runoff to East Antioch Creek. The unnamed creek tributary is proposed to be filled and the runoff conveyed in a new pipe. The impacts to the stormwater drainage system will be less than significant.

Wastewater Collection System

Planned DDSD Water Pollution Control Facility capacity will be sufficient to treat the wastewater generated by new development in the Planning Area. However, the municipal wastewater collection system will need to be upgraded and expanded to support development in the Planning Area. Specific Plan policies prioritize water conservation in new development, therefore, less wastewater should be generated, and the impacts to the wastewater management collection system will be less than significant.

Solid Waste

The landfills used by the City of Antioch's solid waste contractor have the permitted capacity to accommodate the solid waste generated by development in the proposed Plan. The City of Antioch has met the state-mandated diversion levels in 2005 and 2006. Based on the draft CIWMB per capita disposal rate equivalent, 4.2 pounds, the proposed Plan development will be required to generate less than 21,000 pounds (10.5 tons) of solid waste per day. Even though no adverse impacts are anticipated and evaluated in this EIR, the proposed Plan includes policies intended to reduce solid waste generation and disposal in the Planning Area. No potential adverse impacts were identified and analyzed because adequate landfill capacity is available and the City has met the state-mandated diversion levels.

Gas and Electricity

According to PG&E, the anticipated energy demand would not exceed the energy generation capacity. As new development must meet California's Title 24 energy-efficiency requirements, the proposed Specific Plan will not result in wasteful, inefficient, and unnecessary consumption of energy or have an adverse effect on local and regional energy supplies. Therefore, this impact is not analyzed further.

IMPACTS AND MITIGATION MEASURES

3.13-1 ***Expected buildout of the Hillcrest Station Area will increase demand for potable water in the Planning Area and will require the expansion of the municipal water distribution system. (Less than Significant)***

The Contra Costa Water District has a water supply contract through 2045 with the U.S. Bureau of Reclamation for water from the Central Valley Project. The CCWD contract provides up to 195,000 acre feet per year for the total service area. CCWD is prepared to sell the City all its projected water needs through year 2028, unless constrained by drought conditions. The total available water supply for the City of Antioch is projected to be 49,140 acre feet per year in 2025. This is almost double the projected water demand for the whole City, as analyzed in the 2006 Urban Water Management Plan. Thus the City will have an adequate water supply during normal, single dry years, and multiple dry years.

Projected new water demand associated with the development program is primarily associated with population growth. The 2006 Urban Water Management Plan uses a water use factor of 190 gallons per capita per day to project water use in the City. Based on this assumption, the projected development in the Planning Area would require approximately 950,000 gallons per day (1,064 acre feet per year). The anticipated water demand from the Station Area will not cause the City's total demand to exceed the total available supply. Nor will it require that the water treatment plant capacity be increased beyond projections in the Urban Water Management Plan.

The new water demand created by development in the Station Area requires improvements to the existing water distribution infrastructure. New water distribution lines are expected to be installed along new major roads, Viera Avenue (new), Slatten Ranch Road, Oakley Road, and Phillips Lane (New). New lines will be efficiently connected to the existing system and provide hook-ups to new development areas. The existing lines may be moved or removed.

Compliance with General Plan and Specific Plan policies that address water supply, distribution, and water conservation will ensure that impacts on the municipal water system and supply are less than significant.

Specific Plan Policies that Reduce Impact

Implementation of the following proposed Specific Plan policies would help to reduce the impact on the municipal water treatment and distribution system to a less than significant level:

UT-5 Expand the water distribution system such that it is adequate to serve new development in the Hillcrest Station Area, as conceptually illustrated in Figure 6-3, Existing and Future Water System.

UT-6 Work with the Contra Costa County Fire Protection District to determine required fire flow and the need for water pressure boosting systems.

UT-7 To reduce water consumption, require the installation of:

- Low-flow showerheads, faucets, and toilets;
- Low-flow irrigation systems in public rights-of-way, public parks, and recreation areas; and,
- Drought-tolerant plant palettes in all new streetscape areas.

UT-8 To reduce water consumption, recommend the installation of:

- Low-flow irrigation systems in private landscaped areas; and
- Drought-tolerant plant palettes in private landscaped areas.

Mitigation Measures

No mitigation measures are required.

3.13-2 ***Implementation of the proposed Specific Plan would increase urban runoff and require the expansion of the municipal stormwater management system. (Less than Significant)***

Storm runoff is expected to increase as the Station Area develops. Areas that are now vacant soil will be paved and built upon. Therefore improvements to the stormwater collections system could be required. Specific Plan policies below require a Drainage and Flood Management Master Plan for the Hillcrest Station Area. It is anticipated that new stormwater lines will be constructed along the major roads in the area. Lines will drain directly to the detention basins or the wetlands.

Specific Plan Policies that Reduce Impact

Implementation of the following proposed Specific Plan policies would help to reduce the impact of increased urban runoff on the municipal stormwater management system to a less than significant level:

UT-1 Prior to approval of any land subdivisions or development projects within the Hillcrest Station Area, a Drainage and Flood Management Master Plan shall be prepared in collaboration with Contra Costa County Flood Control and Water Conservation District, the City of Antioch Public Works Department, the City of Antioch Planning Department, and the City of Antioch Parks and Recreation Department. The Plan shall:

- Document the overall drainage and flood control concept to be employed within the Hillcrest Station Area to ensure adequate and safe storm flows and to minimize flooding;
- Address funding and responsibility for long-term maintenance of the flood control improvements;
- Demonstrate how the natural hydrologic functions of the site are integrated with the storm drainage system and the overall site design, to the maximum extent feasible; and,
- Identify how improvements can be phased for each development area.

UT-2 Continue the Contra Costa County Flood Control and Water Conservation District Drainage Area Fee Program to fund flood control improvements in the Hillcrest Station Area.

UT-3 Ensure that new development provides needed drainage and flood protection improvements in proportion to a project's impacts, to assure an equitable distribution of costs to construct and maintain drainage infrastructure. Construct new trunk mains along the backbone street alignments and provide connections into East Antioch Creek, as shown conceptually in Figure 6-2, Existing and Future Storm Drains.

UT-4 Minimize total impervious areas by allowing narrow road sections and shared driveways, and using pervious materials on driveways, gutters, and off-street parking areas, where appropriate.

EH-45 Development projects in the Station Area shall comply with the requirements of Provision C.3 of the NPDES Municipal Stormwater Permit issued to the Contra Costa County Clean Water Program. As required by the C.3 Provisions, building permit applications must be accompanied by a Stormwater Control Plan, for review and approval by the City Engineer, which specifies the treatment measures and appropriate source control and site design features that will be incorporated into project design and construction to reduce the pollutant load in storm water discharges and manage runoff flows.

EH-46 Design storm drainage and flood control structures to minimize erosion and creek sedimentation, and to preserve and enhance the wildlife habitat and vegetation of East Antioch Creek.

Mitigation Measures

No mitigation measures are required.

3.13-3 *Expected buildout of the proposed Specific Plan will require the expansion of the municipal wastewater collection system. (Less than Significant)*

Due to the lack of development within the Hillcrest Station Area, there is limited sewer service. Sewer lines serve the adjacent neighborhoods to the north. These pipes flow to the Antioch Pump Station. No improvements were recommended for this pipeline in the *2003 Wastewater Collection System Master Plan*. There is one line that parallels the eastern edge of the Planning Area, which collects wastewater from the southern part of the City and transports it to the Bridgehead Pump Station. Wastewater from the Planning Area would flow either to this main, the sewer line serving the neighborhood north of the Planning Area, or a new main line. The *Wastewater Collection System Master Plan* evaluated projected flows with and without the Roddy Ranch and Ginochio Focus Areas. Since 2003, Roddy Ranch and a portion of the Ginochio Focus Area, about 200 acres, have been annexed into the City.

According to the *Wastewater Collection System Master Plan,* the General Plan SR 4 Industrial Frontage Focus Area would generate approximately 246,000 gallons of wastewater per day at the time of General Plan buildout (2020). This amount would be doubled when peaking factors are applied. To support this development and other development in south Antioch, the 2003 Master Plan recommended that 3,567 feet of sewer main on the eastern edge of the Planning area between the UP railroad and East 18th Street be replaced. If Roddy Ranch and Ginochio Focus areas are not

developed, the main should be replaced with either a 39-inch new pipe or a 27-inch parallel pipe. If the two focus areas are developed, then the main should be replaced with a 45-inch new pipe or a 33-inch parallel pipe.

Table 3.13-7 estimates the total gallons of wastewater flow per day based on the unit flow factors used by the City of Antioch and the projected development under the proposed Plan. The projected development would generate almost 424,000 gallons of wastewater per day. By applying peaking factors, the estimated wastewater flow is almost doubled. These estimates do not account for groundwater infiltration or rain dependent infiltration and inflow. Based on the existing General Plan land uses, the estimated wastewater flow for the Planning Area evaluated in the *2003 Wastewater Collection Master Plan* would have been approximately 311,000 gallons per day. (This estimate uses the Mixed Use commercial flow factor [400] and the maximum anticipated persons per acre [25] for the TOD land use district.) The projected development under the proposed Plan would generate 37 percent more wastewater per day. Therefore the planned improvements of the existing system are likely to be insufficient.

Table 3.13-8 Buildout Projections: Average Daily Wastewater Flows

Land Use	*Gross Acres*	*Commercial Unit Flow Factor (gpd/acre)*	*Population*	*Residential Unit Flow Factor (gpd/capita)*	*Wastewater Flow (gpd)*	*Peak Wastewater Flow (gpd)* [1]
Town Center Mixed Use	105.5	1000	3,000	55	270,500	541,000
Residential TOD	38.2		2,000	55	110,000	187,000
Office TOD	36.6	700			25,620	51,240
Community Retail	13.0	1000			13,000	26,000
eBART Yard and Future Station	9.7	500			4,850	9,700
Total	**203.0**		**5,000**		**423,970**	**814,940**

1. Peaking factor assumed to be 2 for mixed use areas; 2 for commercial areas; and 1.7 for residential areas.

Source: Dyett & Bhatia, 2008.

The substantial increase in wastewater generation created by development in the Station Area requires improvements to the existing wastewater collection infrastructure. New trunk lines will be built along new major roads. In addition, the planned improvements to the sewer mains documented in the *2003 Wastewater Collection System Master Plan* may not be sufficient to support the cumulative City growth. Therefore, the City's wastewater model will need to be updated based on the proposed land uses in the Planning Area, plus Roddy Ranch and the annexed portion of the Ginochio Focus Area.

Specific Plan Policies that Reduce Impact

Implementation of the following proposed Specific Plan policies would help to reduce the impact on wastewater collection and treatment to a less than significant level:

UT-9 Expand the wastewater collection system such that it is adequate to serve new development in the Hillcrest Station Area, as conceptually illustrated in Figure 6-4, Existing and Future Sewer System. The 2003 Wastewater Collection System Master Plan identifies the sewer main on the eastern edge of the Planning Area between the Union Pacific Railroad tracks and East 18th as needing substantial additional capacity.

UT-10 Amend sewer fees and/or other financing mechanisms if necessary such that Hillcrest Station Area project sponsors pay their fair share of the costs for sewer main improvements.

Mitigation Measures

No mitigation measures are required.

4 Alternatives

CEQA mandates consideration and analysis of alternatives to the proposed General Plan. According to CEQA Guidelines, the range of alternatives "shall include those that could feasibly accomplish most of the basic purposes of the project and could avoid or substantially lessen one or more of the significant impacts" (Section 15126(d)(2)). The alternatives may result in new impacts that do not result from the proposed Specific Plan.

Case law suggests that the discussion of alternatives need not be exhaustive and that alternatives be subject to a construction of reasonableness. The impacts of the alternatives may be discussed "in less detail than the significant effects of the project proposed" (CEQA Guidelines section 15126.6(d)). Also, the Guidelines permit analysis of alternatives at a less detailed level for general plans and other program EIRs, compared to project EIRs. The Guidelines do not specify what would be an adequate level of detail. Quantified information on the alternatives is presented where available; however, in some cases only partial quantification can be provided because of data or analytical limitations.

4.1 BACKGROUND ON DEVELOPMENT OF ALTERNATIVES

The proposed Plan came about as a result of a thorough planning process. The process emphasized community goals and the opportunities and constraints of the Planning Area. To define the goal and a thorough understanding of the site, the planning team conducted: field visits, existing plans and studies review, stakeholder interviews, monthly coordination meetings with city staff and BART, City Council Study Sessions, and community workshops. Individual stakeholders were interviewed in March and April 2008. Comments received from the interviews were published in a Stakeholders Interviews Summary Report in May 2008. In addition, an Existing Conditions, Opportunities, and Constraints Report was published in May 2008. This report identified major development issues that needed to be addressed in the Specific Plan, along with significant environmental and circulation constraints. A *Market Overview and Absorption Projections Report* was also prepared, analyzing the market demand and absorption potential for residential, retail, and office uses. Subsequently, alternatives were then prepared based on the opportunities and constraints analysis and the comments received from stakeholders.

ALTERNATIVES INITIALLY CONSIDERED

The Station Area Alternatives originally identified in the Alternative Development Scenarios Report were initially intended to respond to community needs and provide a reasonable range of land use scenarios based on alternative eBART station locations. Meetings with the City Council, consulting team, city staff, and property owners provided feedback in order to refine the diagrams. City Council Study Sessions were conducted on May 20 and July 8. The alternative diagrams and draft project description were presented to the Planning Commission as part of the Environmental Impact Report scoping session on June 18, 2008.

The initial Station Area Alternatives presented three land use concepts, The Alternative Plan: Median Station, Alternative 2: Northside West Station, and Alternative 3: Northside East Station. These Alternatives differed in both the amount and the design of new development, as determined by the location of the eBART Station and potential for transit-oriented development. These plans

provided a range of options for physical growth within the Planning Area and represented varying amounts of development capacity. A subsequent fourth alternative was prepared, based on further studies by BART that identified a potential East Median Station.

1. **Median Station.** This option was based on BART's proposed project which includes a single eBART station in the SR 4 median, east of the Hillcrest Interchange and south the Planning Area. The land use plan showed transit-oriented development in the western portion of the Planning Area with business park and retail land uses comprising the remaining portions.
2. **Northside West Station**. This option located the eBART station out of the freeway median, adjacent to the UP right-of-way, near Viera Avenue. BART analyzed various methods to bring the tracks out of the median, including a long or short tunnel or a flyover. This alternative allowed for the development of a transit village, with housing, jobs, and pedestrian retail, just north of the eBART station and the railroad. Commercial retail uses lined the freeway and some business park uses were designated outside the half-mile walking distance of the station.
3. **Northside East Station.** The eBART station was located out of the freeway median adjacent to the UP right-of-way, further east near the Phillips Lane extension in this option. Development based on this option would have been contingent on the construction of a new SR 4 interchange near Phillips Lane. This alternative supported a high-intensity transit village with a wide-variety of uses in the eastern portion of the Planning Area. The western portion of the Planning Area highlighted residential and retail uses.
4. **East Median Station.** This alternative was not included in the *Alternative Development Scenarios Report*, but was presented to the public and City Council at the July 8, 2008 Study Session. This option combined a station in the freeway median with the transit-oriented land use scenario similar to the Northside West Station option. The station located was shifted to the east approximately 900 feet in order to create shorter direct pedestrian and bicycle routes from the eBART station to the development area. This alternative also demonstrated the option of a second eBART station in the eastern portion of the Planning Area which would expand the opportunities for transit-oriented development.

During the planning process, the costs of the alternative eBART station locations were studied, and BART concluded that the Median Station location is the only feasible station location. The other station locations added enormous additional costs that were unfunded; and would delay the project substantially because they would preclude the construction of eBART in tandem with the widening of SR 4. However, because the East Median Station location provides such great advantages to the development of the Hillcrest Station Area, this location continues to be the City's preferred option. Therefore, in the later phases of the planning process, the Median Station and East Median Station alternatives were the focus of the evaluation by the Planning Commission, City Council, and the community.

Ultimately a single proposed plan was prepared, as shown in Chapter 2, Project Description. The Plan shows both the Median Station and the East Median Station locations, and is designed to function with either station location. Policies related to land use, circulation, open space, and infrastructure were developed based on all of the policy discussions throughout the planning process.

4.2 DESCRIPTION OF ALTERNATIVES

This chapter describes and evaluates two alternatives, the Alternative Plan and the No Project scenario, to the proposed Hillcrest Station Area Specific Plan. The Alternative Plan shows a Median Station location, based on BART's proposed project, and a lower intensity of development in the Hillcrest Station Area. Consideration of the No Project alternative is required by CEQA in all EIRs to help decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The No Project scenario is based on the Antioch 2003 General Plan Update, which represents the continuation of the existing plans and policies if the proposed Plan is not adopted. Table 4.2-1 summarizes the buildout of the proposed plan, the Alternative Plan and the No Project scenario.

Table 4.2-1 Buildout of Alternatives

	Proposed Plan	*Alternative Plan*	*No Project*
Residential Units	2,500	650	1,200
Population	5,000	1,680	2,400
Office Area (sf)	1,200,000	630,000	3,000,000
Retail Area (sf)	1,000,000	370,000	500,000
Hotel Rooms	325	-	-
Total Commercial Area (sf)	2,500,000	1,000,000	3,500,000
Employment	5,600 *	2,300 *	4,035 **
Total Daily Trips	45,143	19,827	35,994
Estimated eBART Riders ***	2,060	620	1,124

* Estimated employment for the Proposed Plan and Alternative Plan was calculated using the following assumptions:

- Retail employment is assumed to generate one job for every 500 square feet of gross floor area, based on total gross acres of land.
- Office employment is assumed to generate one job for every 350 square feet of gross floor area, based on total gross acres of land.
- Hotel employment is assumed to generate 0.8 job per hotel room.

** Estimated employment for the No Project scenario was calculated using the following assumptions:

- Retail employment in the TOD area is assumed to generate one job for every 500 square feet of gross floor area, based on total gross acres of land.
- Business park employment is assumed to generate one job for every 1,000 square feet of gross floor area, based on total gross acres of land.

*** Estimated eBART ridership is based on the following assumptions:

- 0.1 rider per job
- 0.6 rider per housing unit

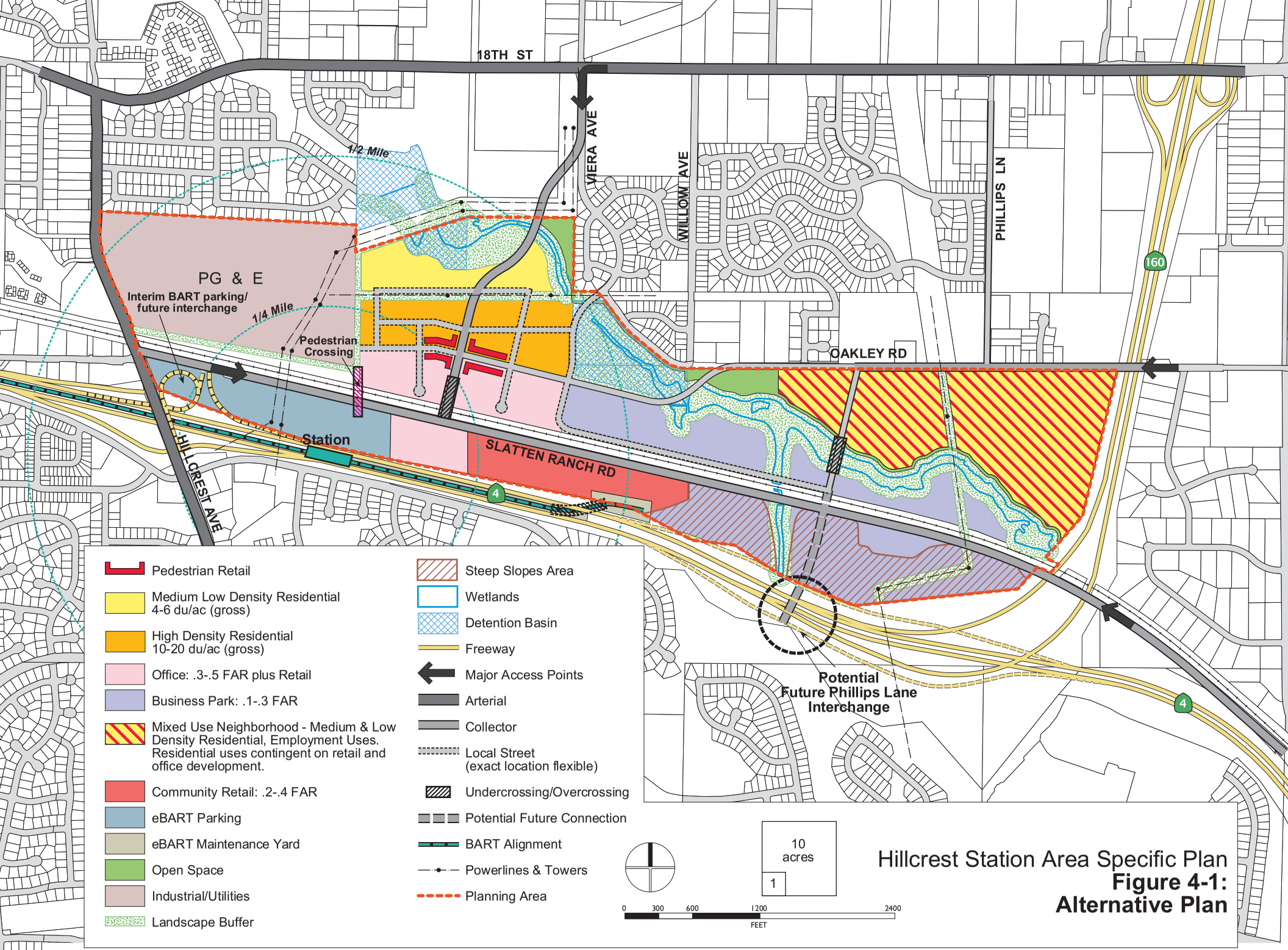
Source: Dyett & Bhatia, 2008

ALTERNATIVE PLAN

The Alternative Plan is based on the BART Proposed Project, which includes one eBART station in the SR 4 median close to Hillcrest Avenue at the Median Station location. The assumed 2035 circulation network is the same as the proposed Plan, with two key exceptions. The Alternative Plan does not include the construction of a Phillips Lane interchange within the planning period; and does not include a potential second station in the eastern portion of the Planning Area. Because the Phillips Lane interchange is not assumed to be built, the Phillips Lane extension would be constructed as a 2-lane collector rather than as a 4-lane arterial.

The Alternative Plan assumes a much lower intensity of development than the proposed Plan. The Phillips Lane Interchange is not assumed to be built, and there will be major traffic and circulation constraints. Lower intensity development is assumed in the eastern portion of the site that is further from freeway interchanges. Very little development is expected to occur in the southeast quadrant in the area where there are steep hills. The PG&E electrical transmission towers and lines that cross north-south in the eastern Planning Area would remain in their current location, rather than being relocated as in the proposed Plan.

The Alternative Plan features residential and office use near the station to support the transit investment. The eastern portion is designated as lower intensity uses such as business park and a mixed-use neighborhood focused on commercial and residential uses. The Alternative Plan supports 650 residential units with approximately 1,680 new residents. The designated land uses and transportation system would support approximately 1.0 million square feet of commercial uses, 630,000 square feet of office and 370,000 square feet of retail, with about 2,300 new jobs at buildout. Figure 4-1 illustrates the Alternative Plan Overview.



Hillcrest Station Area Specific Plan
Figure 4-1: Alternative Plan

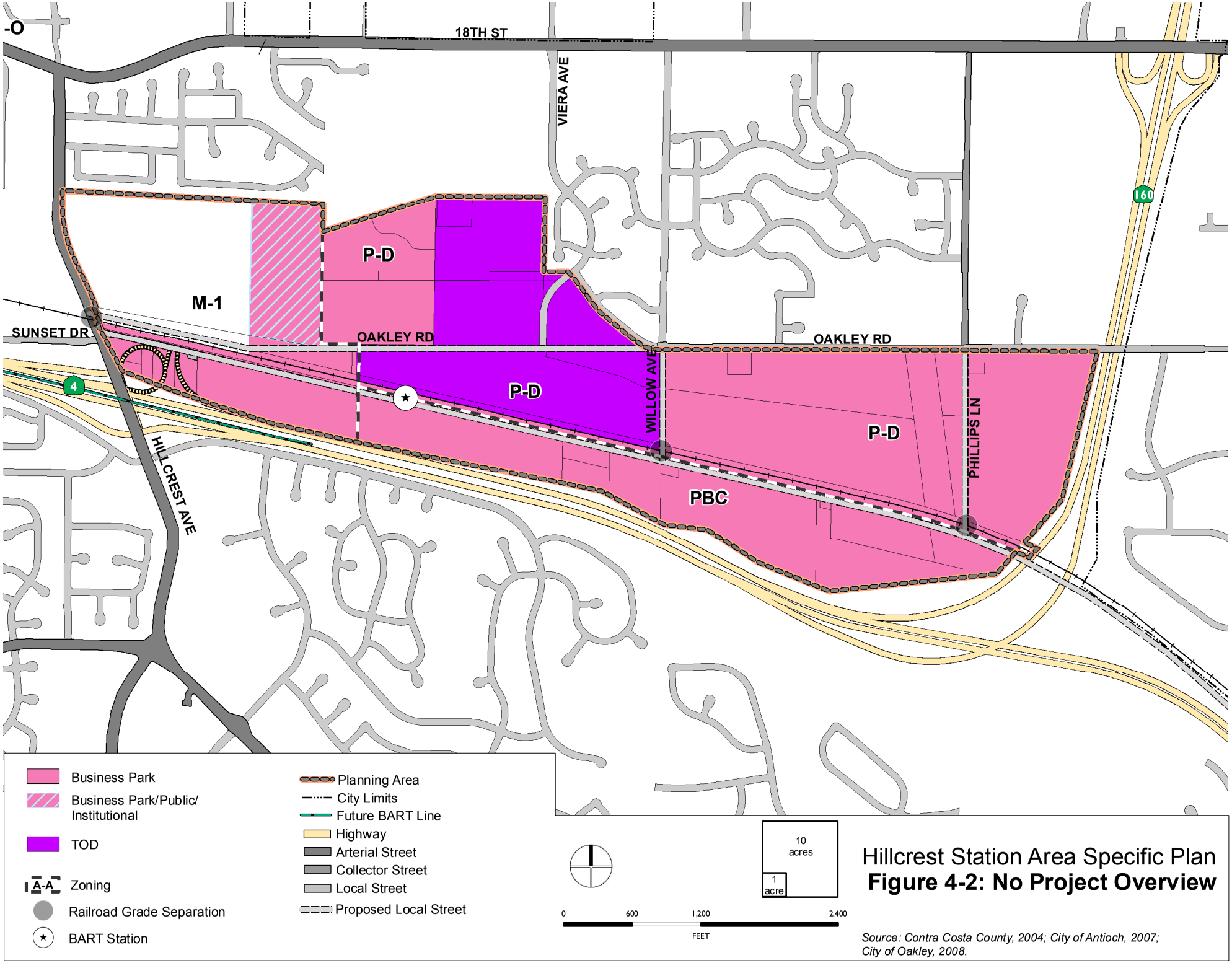
NO PROJECT – EXISTING ANTIOCH GENERAL PLAN

The no project scenario is based on the current General Plan, which was updated in 2003. The Zoning Ordinance was updated to implement the General Plan in 2005. Therefore, this scenario illustrates the expected development if the Planning Area's existing policies and land use regulations were to remain in place, and planned circulation improvements were to be constructed, including BART service. An overview of the General Plan, plus zoning designations, is illustrated in Figure 4-2. The major differences between the proposed Plan and the General Plan are listed in Table 4.2-2.

Table 4.2-2 General Plan and Proposed Plan Assumptions

Difference	*General Plan*	*Proposed Plan*
Planning Horizon	2030	2035
BART Station Location	Near railroad track and Viera Ave	In SR 4 Median near Hillcrest Avenue
Phillips Lane Interchange	Not included	Assumed to be built, but not part of Specific Plan
Viera Avenue	Not extended	Re-aligned and extended to Slatten Ranch Road with railroad grade separation
Willow Avenue	Improved with a railroad grade separation	Does not include a grade separation or specific improvements
Eastern set of PG&E Transmission Towers and Lines	Not relocated	Relocated along the SR 4/SR 160 right-of-way

The General Plan identifies the Planning Area as the SR 4 Industrial Frontage Focus Area. The designated land uses are mostly low-intensity uses such as business park. Transit-oriented development is designated near a BART station located in the Planning Area near the Union Pacific railroad tracks. Based on the land use designations in the 2003 General Plan, and the detailed text and tables in the General Plan that explain allowed densities, this area would support approximately 1,200 housing units and 4,035 jobs. The Existing Conditions, Opportunities, and Constraints Report for the Hillcrest Station Area Specific Plan (Dyett & Bhatia 2008) provides additional detail on the calculations of projected development under the 2003 General Plan and Existing Zoning.



Hillcrest Station Area Specific Plan
Figure 4-2: No Project Overview

Source: Contra Costa County, 2004; City of Antioch, 2007; City of Oakley, 2008.

NORTHSIDE EAST STATION PLAN

One of the alternatives considered during the planning process was a plan based on having one eBART station located out of the SR 4 median near the future Phillips Lane and adjacent to the Union Pacific railroad tracks. The plan is contingent on the construction of the SR 4/Phillips Lane Interchange. The plan framework allows for an intensive mixed-use transit village/lifestyle center in the eastern portion of the Planning Area. This plan has a retail and residential focus, and allows for up to 325 hotel rooms. The western portion of the Planning Area has been designated with lower density residential and commercial uses. The Northside East Station plan would support a higher population, by about 30 percent, than the proposed Plan, due to the higher number of units allowed. The Northside East Station Plan would support about 20 percent fewer jobs than the proposed Plan.

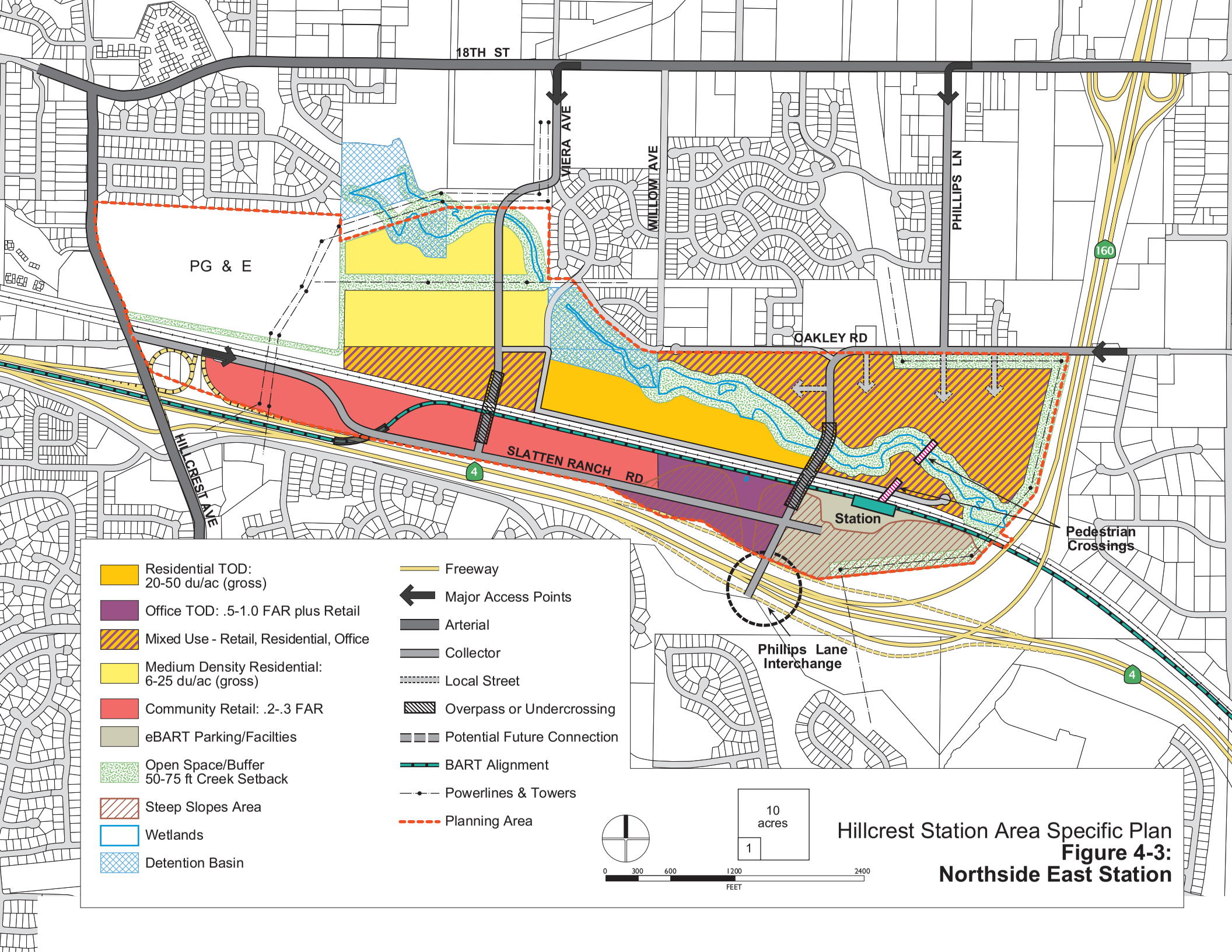
Table 4.2-3 Northside East Station Development Potential

	Acres	*Commercial SF*	*Units*	*Jobs*
Housing	55.8		1,650	
Mixed Use	67.8	669,000	1,810	3,100
Office	18.2	750,500		710
Community Retail	34.4	374,100		750
Open Space	102.8			
Total		**1,793,600**	**3,460**	**4,560**

Source: Dyett & Bhatia, 2008. Existing Conditions, Opportunities, and Constraints Report.

Overall, the development level and environmental impacts would be similar to the proposed Plan, because the Northside East Plan would be assumed to have the same environmental protection and hazard mitigation policies as the proposed Plan. Traffic impacts would be equal to or less than the proposed Plan, because more traffic would use the Phillips Lane Interchange to access development and the eBART station, and less traffic would go through the Hillcrest Interchange. However, the Northside East Plan would allow residential units near the railroad tracks; and thus increase the potential noise and air quality impacts on residents and sensitive receptors.

Because the Northside East Station plan allows more than 2,500 housing units and the station location outside of the SR 4 median has been deemed infeasible by BART, this alternative is not evaluated further.



Hillcrest Station Area Specific Plan

Figure 4-3:
Northside East Station

4.3 COMPARATIVE IMPACT ANALYSIS

This comparative analysis of alternatives evaluates impacts in the same environmental issue areas analyzed in Chapter 3 of this EIR for the proposed Plan. The analysis of the proposed Plan has determined that there are significant and unavoidable impacts for circulation and noise. In addition, due to regional growth there are cumulatively significant impacts to air quality and climate change; however, the proposed Plan will not make a considerable contribution to those impacts. The alternatives evaluated in this chapter would reduce certain adverse impacts, but the significant and unavoidable impacts for circulation and noise cannot be feasibly mitigated. It is assumed that he Alternative Plan would include the same specific environmental protection and urban design policies as the proposed Plan, while the No Project scenario only includes the general policies from the General Plan.

AESTHETICS AND VISUAL QUALITY

The visual resources impact of the proposed Plan is less than significant.

Alternative Plan

A difference between the Alternative Plan and the proposed Plan is that while the entire Planning Area has designated land uses in both plans, due to the market and cost constraints, the steep hills in the southeastern quadrant adjacent to the SR 4 are not assumed to develop within the planning horizon, prior to 2035. Therefore, the grading that would be necessary to support the Phillips Lane interchange, a potential second eBART station, and Town Center Mixed Use development, is not required in the Alternative Plan. The hills would remain ungraded, and thus the visual character would be more similar to its current condition. The designated land uses in the Alternative Plan are less intense, particularly in the eastern portion of the Planning Area. Therefore building heights will be lower than in the proposed Plan. However, implementation of the existing General Plan policies and the proposed urban design policies would provide sufficient protection for the visual resources so that the impact would be less than significant.

No Project

Under the General Plan business park and transit-oriented development is expected to occur in the Planning Area before 2030. The development would generally be lower density than under the proposed Plan. There would be a large extent of industrial development in the no project scenario, whereas the proposed Plan does not include industrial land use designations. However, the General Plan includes policies that: protect the areas that the City considers to be of high quality visual character, namely the hillsides close to Mt. Diablo; protect view corridors; and limit light and glare particularly in rural areas. Implementation of these policies would reduce any impact of development in the Planning Area on visual resources to less than significant.

AIR QUALITY

The air quality impact of the proposed Plan is cumulatively significant and unavoidable, however, the project contribution is less than considerable, and thus the project impact is less than significant.

Alternative Plan

The Alternative Plan supports fewer new housing units, a lower projected population, and fewer total jobs at buildout. The total impact on air quality would be less than the proposed Plan because there are fewer mobile and stationary sources of criteria air pollutants, toxic air contaminants, and odors. In addition, the land uses and circulation plans under the Alternative Plan are not integrated in such a way to significantly reduce the local VMT to less that the City as a whole. Therefore the project will contribute to the significant cumulative air quality impacts.

No Project

The General Plan for the entire City of Antioch was found to have significant and unavoidable impacts on air quality for being inconsistent with the adopted *Bay Area 2000 Clean Air Plan*. It was expected that the City population would grow approximately 1.5 percent per year between 2003 and 2030 while the daily vehicle miles traveled grow approximately 2.25 percent per year. Recent ABAG projections indicate that the anticipated employment growth rates will continue to keep Antioch's VMT growth rate higher than the anticipated population growth. Due to the high growth rates between 2000 and 2005, Antioch continues to be inconsistent with the adopted *Bay Area 2005 Ozone Strategy*.

Even the implementation of policies that require travel demand management programs for new large development projects, and purchasing low-emission vehicles for the City fleet, the City's impact on regional air quality would be significant and unavoidable. The land uses and circulation plans under the No Project scenario are not integrated in such a way to significantly reduce the local VMT to less that the City as a whole. Therefore the project will contribute to the significant cumulative air quality impacts.

BIOLOGICAL RESOURCES

The impact of the proposed Plan on biological resources is considered less than significant due to the adoption of specific policies and actions to be implemented to protect nesting birds, Swainson's hawks, burrowing owls, bats, potential Valley Elderberry Longhorn Beetle (VELB) habitat, wetlands and riparian habitat, and established trees.

Alternative Plan

The Alternative Plan is assumed to have the same or similar policies and actions as the proposed Plan. Due to the greater potential for not developing the hills in the southeast quadrant and the unnamed creek tributary of East Antioch Creek in the Alternative Plan, approximately 20 more acres of protected species and sensitive habitat would likely remain to support birds and bats than under the proposed Plan. The elderberry bushes that are potential habitat for VELB are located on the hills near the PG&E transmission towers and lines in the eastern portion of the Planning Area. Under the Alternative Plan, since these towers are not moved, the required landscape buffers for the utility easements would potentially protect the bushes. In addition, less of the delineated

wetland area would be developed than in the proposed Plan. Overall, the Alternative Plan would have less impact on biological resources than the proposed Plan.

No Project

The General Plan classified the Planning Area as grasslands, but did not identify any specific special status species in the area. The extensive grasslands in the southern part of the City were identified as belonging to a regional grassland linkage between Mt. Diablo and the Delta wetlands. The General Plan policies that focus on avoiding and minimizing impacts to sensitive habitat types; maintaining and conserving native vegetation; and requiring the preparation of Resource Management Plans (RMP) generally ensure the protection of special status species and sensitive habitats. An RMP would likely be required for East Antioch Creek and wetlands in the Planning Area. In addition federal- and state-mandated mitigations for nesting bird and raptor habitat would protect the species found in the Planning Area. The City of Antioch Tree Ordinance establishes the guidelines for tree preservation and regulation. Overall, the No Project scenario would have similar or less impact on biological resources as the proposed Plan.

CIRCULATION

The proposed Plan would have significant and unavoidable impacts on the regional highway system and local intersections, and less than significant impacts on vehicle miles traveled, transit, parking, pedestrian and bicycle circulation, freight rail, and emergency access. The proposed Plan is generally consistent with adopted regional transportation plans and does not include any hazardous design features. Table 4.3-1 summarizes the total trips for each alternative at buildout in 2035.

Table 4.3-1 Projected 2035 Total Trips for Alternatives

	Alternative Plan	*Proposed Plan*	*No Project*
AM Peak Hour	1,222	2,809	3,166
Percent of Proposed Plan	*44%*		*113%*
Percent of No Project	*39%*	*89%*	
PM Peak Hour	2,132	4,685	4,856
Percent of Proposed Plan	*46%*		*104%*
Percent of No Project	*44%*	*96%*	
Daily	19,827	45,143	35,994
Percent of Proposed Plan	*44%*		*80%*
Percent of No Project	*55%*	*125%*	

Source: Fehr & Peers, 2009; Dyett & Bhatia, 2009.

Alternative Plan

The Alternative Plan would generate less than 20,000 total trips per day. This is less than half of the trips generated by the proposed Plan. Table 4.3-2 summarizes the inputs for both the proposed Plan and the Alternative Plan. Based on the lower development density in the Alternative Plan, it will have a lower internal trip capture rate than the proposed Plan.

Table 4.3-2 Development and Land Use Inputs for Proposed and Alternative Plans

	Alternative Plan				*Proposed Plan*			
Office (ksf)	630				1200			
Residential (dwelling units)	650				2500			
Retail (ksf)	370				1000			
Hotel (rooms)	0				325			
Peak Hour Analyzed	AM		PM		AM		PM	
Trip Generation Rate (Office)	1.55		1.49		1.55		1.49	
Trip Generation Rate (Residential)	0.51		0.62		0.51		0.62	
Trip Generation Rate (Retail)	1.03		3.75		1.03		3.75	
Trip Generation Rate (Hotel)	0.56		0.59		0.56		0.59	
Raw Trip Generation Rate (Office)	977		939		1860		1788	
Raw Trip Generation Rate (Residential)	332		403		1275		1550	
Raw Trip Generation Rate (Retail)	381		1388		1030		3750	
Raw Trip Generation Rate (Hotel)	0		0		196		207	
Internal Capture %	15%		14%		24%		29%	
Transit Reduction % for HBW Trips	19%		17%		19%		17%	
Transit Reduction % for Other Trips	6%		5%		6%		5%	
Net Trips (Office)	670		634		1118		1142	
Net Trips (Residential)	259		240		1004		992	
Net Trips (Retail)	293		1258		527		2357	
Net Trips (Hotel)	0		0		175		194	
Net Trips In / Net Trips Out (Office)	590	80	108	526	984	134	194	947
Net Trips In / Net Trips Out (Residential)	52	207	84	156	201	803	347	645
Net Trips In / Net Trips Out (Retail)	178	114	604	654	322	206	1131	1225
Net Trips In / Net Trips Out (Hotel)	0	0	0	0	107	68	103	91

/1/ The Proposed Plan assumes that the Phillips Lane interchange is constructed during the planning period.

Source: Fehr & Peers, 2008

Intersection Operations

Table 4.3-3 summarizes the projected intersection operations for the Alternative Plan. At buildout in 2035, under this Plan six intersections would not meet the level of service (LOS) standards. However, this data table does not reflect the effects of the proposed Plan policies to implement improvements to the Hillcrest Avenue and East 18th Street intersection and to support the City of Oakley's efforts to maintain efficient traffic operations at the Neroly Road and Oakley Road intersection. If the proposed policies are implemented for the Alternative Plan, the Hillcrest Avenue and East 18th Street intersection and the Neroly Road and Oakley Road intersection would likely operate at acceptable levels; and four intersections would not meet the LOS standards.

Table 4.3-3 Alternative Plan Intersection Operations Weekday AM and PM Peak Hour – HCM Methodology

Intersection	*Control*	*Peak Hour*	*Delay*	*LOS*
1. Hillcrest Avenue at East 18th Street	Signal	AM	**74**	**E**
		PM	**57**	**E**
2. Viera Avenue at East 18th Street	Signal	AM	16	B
		PM	13	B
3. Phillips Lane at East 18th Street	Signal	AM	6	A
		PM	6	A
4. SR 160 Southbound Ramps at East 18th Street	Signal	AM	23	C
		PM	16	B
5. SR 160 Northbound Ramps at East 18th Street	Signal	AM	11	B
		PM	12	B
6. Bridgehead Road/Neroly Road at Main Street	Signal	AM	15	B
		PM	25	C
7. Hillcrest Avenue at Sunset Drive	Signal	AM	**#**	**F**
		PM	**#**	**F**
8. Phillips Lane at Oakley Road	Signal	AM	29	C
		PM	33	C
9. Neroly Road at Oakley Road	All-Way Stop	AM	**--**	**F**
		PM	**--**	**F**
10. Hillcrest Avenue at SR 4 Westbound Ramps	No Control	AM	This intersection is replaced with a northbound to westbound loop ramp to SR 4 as part of the planned Hillcrest Interchange Improvement Project.	
		PM		
11. Hillcrest Avenue at SR 4 Eastbound Ramps	Signal	AM	**#**	**F**
		PM	**#**	**F**
12. Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue	Signal	AM	**#**	**F**
		PM	**#**	**F**
13. Hillcrest Avenue at Deer Valley Road/Davidson Drive	Signal	AM	18	B
		PM	23	C
14. Phillips Lane at Slatten Ranch Road	Signal	AM	32	C
		PM	40	D
15. Phillips Lane at SR 4 Westbound Ramps	Signal	AM	These intersections do not exist for this scenario	
		PM		
16. Phillips Lane at SR 4 Eastbound Ramps	Signal	AM		
		PM		
17. SR 4 Westbound Ramps at Slatten Ranch Road	Signal	AM	**#**	**F**
		PM	**#**	**F**

Bold indicates intersection operating at deficient level of service.

# indicates that delay is not meaningful because not all the vehicles are able to traverse the intersection.

Delay is measured in seconds and represents the average intersection control delay calculated using the HCM methods.

Source: Fehr & Peers, 2008.

Without the new SR 4/Phillips Lane Interchange, the intersections shown in Table 4.3-4 would not meet the LOS standard. This table illustrates that the operations at these four intersections would be substantially worse than under the proposed Plan, since they would serve a lower percentage of vehicles. Therefore, significant and unavoidable impacts would remain at the following study intersections: Hillcrest Avenue at Sunset Drive, Hillcrest Avenue at SR 4 Eastbound ramps, Hillcrest Avenue at SR 4 Westbound Ramps, and Hillcrest Avenue at Tregallas Drive/Larkspur Avenue.

Table 4.3-4 2035 Intersection Operations Weekday AM and PM Peak Hour – Percent Vehicles Served for the Alternative Plan and the Proposed Plan

	Alternative Plan		*Proposed Plan*	
Intersection	*AM*	*PM*	*AM*	*PM*
7. Hillcrest Ave at Sunset Dr	90%	67%	96%	97%
11. Hillcrest Ave at SR 4 Eastbound Ramps	84%	60%	92%	87%
12. Hillcrest Ave at East Tregallas Dr/Larkspur Ave	82%	67%	92%	88%
17. SR 4 Westbound Ramps at Slatten Ranch Rd	94%	59%	97%	99%

Percent vehicle served is calculated by dividing the actual number of vehicles able to traverse the intersection by the total number of vehicles forecast to traverse the intersection. Intersections with values less than 95% are considered to be operating at deficient levels. The SimTraffic component of the Synchro software was used to determine vehicles served.

Source: Fehr & Peers, 2008.

Freeway Operations

Table 4.3-5 indicates that the eastbound freeway operations on SR 4 under the Alternative Plan would fail for the PM peak hour in 2035. Without the Phillips Lane Interchange, the impacts of any development in the Planning Area would result in a significant and unavoidable impact on SR 4.

Table 4.3-5 2035 SR 4 Delay Index

	Eastbound				*Westbound*			
	AM		*PM*		*AM*		*PM*	
	Speed (mph)	*Delay Index*	*Speed (mph)*	*Delay Index*	*Speed (mph)*	*Delay Index*	*Speed (mph)*	*Delay Index*
Alternative Plan	70	1.00	23	**3.04**	70	1.00	70	1.00

Bold indicates that the adopted delay index standard of 2.5 or less is not met.

Source: Fehr & Peers, 2008

Pedestrian and Bicycle Access and Circulation

Under the Alternative Plan, pedestrian and bicycle facilities similar to those in the proposed Plan would be implemented. The one exception is that there would a single multi-use trail next the East Antioch Creek rather than a loop trail system as proposed.

Transit

Buildout of the land uses under the Alternative Plan would result in less additional demand for transit than the proposed Plan. Because there would be fewer houses and jobs at buildout under the Alternative Plan, fewer transit riders would be from the Planning Area. BART provided the following eBART ridership generation rates for areas within 0.5 miles of a station: 0.1 riders per job and 0.6 riders per housing unit. Based on these rates, the Alternative Plan and uses would generate approximately 620 eBART riders. This is 30 percent of the riders generated by the proposed Plan, which is estimated to be 2,060. However, because the eBART station is planned to be a terminal station that serves the whole East County area, the total number of projected riders would be the same as under the proposed Plan. This means that more riders would be driving or taking the bus, and fewer would be able to walk or bicycle, to the station and bus facilities. This would exacerbate the congestion on the roads and highways, and increase the demand for parking.

No Project

Roadway Network

The Antioch General Plan Update Draft EIR indicates that some segments of Hillcrest Avenue between East 18th Street and Larkspur, and SR 4 and 160 near the Planning Area would operate at LOS D in 2020. However, only one Hillcrest Avenue segment north of SR 4 would operate at levels worse than the regional standard of 0.85 volume-to-capacity ratio (v/c). The General Plan Update EIR found that such conditions were significant and unavoidable due to regional growth and the cumulative impact on traffic conditions.

The No Project scenario would generate approximately 36,000 trips each day. Even though there would be a similar level of development under the No Project scenario as the proposed Plan, there are fewer retail uses; therefore there are fewer daily trips to and from the Planning Area. However, as seen in Table 4.3-1, the peak hour traffic would be worse than the proposed Plan because the Phillips Lane Interchange would not be built. Therefore, it is reasonable to assume that intersection and freeway operations would be worse in 2035 under the No Project scenario than either the proposed Plan or the Alternative Plan.

Pedestrian and Bicycle Access and Circulation

Under the No Project scenario, basic pedestrian facilities would be provided in the Planning Area. No new bicycle facilities were identified in the General Plan for the area. The closest proposed bike route would be along Hillcrest Avenue. General Plan policies support walking and biking and ensure that general safety measures are maintained. However, there are no specific policies that would ensure that the potential demand for facilities is met in the Planning Area.

Transit

Buildout of the land uses under the No Project scenario would result in less additional demand for transit than the proposed Plan. Because there would be fewer houses and jobs at buildout under the No Project scenario, fewer transit riders would be from the Planning Area. Based on BART's ridership generation rates, the Planning Area under the No Project scenario would generate 1,124 riders. This is 55 percent of the riders generated by the proposed Plan, which is estimated to be 2,060. However, because the eBART station is planned to be a terminal station that serves the whole East County area, the total number of projected riders would be the same as under the proposed Plan. This means that more riders would be driving or taking the bus, and fewer would

be able to walk or bicycle, to the station and bus facilities. This would exacerbate the congestion on the roads and highways, and increase the demand for parking.

CLIMATE CHANGE AND ENERGY

The climate change impact of the proposed Plan is cumulatively significant and unavoidable, however, the project contribution is less than considerable, and thus the project impact is less than significant. While the proposed Plan will use more energy resources than the existing conditions use, it will have no adverse impact on energy generation capacity or distribution.

Alternative Plan

The estimated Alternative Plan buildout population of 1,680 persons would contribute a total of 14,705 metric tons of carbon dioxide equivalent GHG emissions, if adopted State regulations related to reducing GHG emissions are not implemented or enforced. Using emission reduction factors based on vehicle fuel efficiency and commercial building efficiency, the estimated total GHG emissions would be approximately 12,131 metric tons. This is only 34 percent of the emissions generated by the proposed Plan, and thus the GHG emissions are substantially less with the Alternative Plan. As there is little development currently in the Planning Area, these new emissions would represent an increase compared to existing conditions. Therefore the Alternative Plan will contribute to the significant cumulative climate change impacts, but to a lesser degree than the proposed Plan.

In the Alternative Plan, since the land use and circulation plans are not as dense or as well connected with the local and regional road networks, the estimated vehicles miles traveled (VMT) for residents and employees is similar to the City of Antioch. Under the proposed Plan, the estimated VMT per capita will be less than the City as a whole, because the development is more mixed-use and compact, and people can more easily use transit.

Table 4.3-6 Estimated 2035 Alternative Plan GHG Emissions

Type of Energy Use	*Estimated MTCO2e* [1]	*Estimated $MTCO_2e$ with State Regulation Reduction Factors*
Residential	2,544	2,544
Commercial/Industrial/Direct Access	4,921	3,937
Transportation	6,942	5,353
Land-filled Waste	298	298
Total GHG Emissions	**14,705**	**12,131**
GHG Emissions per Capita	8.75	7.22

1. Emissions estimated using per capita emissions for the County incorporated areas only.

Source: Dyett & Bhatia, 2008

No Project

The estimated No Project buildout population of 2,400 persons would contribute a total of 21,008 metric tons of carbon dioxide equivalent GHG emissions, if adopted State regulations related to reducing GHG emissions are not implemented or enforced. Using emission reduction factors based on vehicle fuel efficiency and commercial building efficiency, the estimated total GHG emissions would be approximately 17,331 metric tons. This is only 48 percent of the emissions generated by the proposed Plan, and thus the GHG emissions are substantially less under the No Project scenario. As there is little development currently in the Planning Area, these new emissions would represent an increase compared to existing conditions. Therefore the Alternative Plan will contribute to the significant cumulative climate change impacts, but to a lesser degree than the proposed Plan.

Similar to the Alternative Plan, the No Project scenario does not optimize transit-oriented development and connected roadways, and thus the estimated vehicles miles traveled (VMT) for residents and employees is similar to the City of Antioch. Under the proposed Plan, the estimated VMT per capita will be less than the City as a whole, because the development is more mixed-use and compact, and people can more easily use transit.

Table 4.3-7 Estimated 2035 No Project GHG Emissions

Type of Energy Use	*Estimated MTCO2e* [1]	*Estimated $MTCO_2e$ with State Regulation Reduction Factors*
Residential	3,635	3,635
Commercial/Industrial/Direct Access	7,030	5,624
Transportation	9,918	7,647
Land-filled Waste	425	425
Total GHG Emissions	**21,008**	**17,331**
GHG Emissions per Capita	8.75	7.22

1. Emissions estimated using per capita emissions for the County incorporated areas only.

Source: Dyett & Bhatia, 2008

CULTURAL RESOURCES

The proposed Plan would have less than significant impacts on cultural resources based on the implementation of specific policies that require project sponsors to identify, research, and consult with the appropriate experts to document and protect cultural resources.

Alternative Plan

The Alternative Plan is assumed to have the same or similar policies and actions as the proposed Plan, which would document and preserve historic resources as appropriate. Due to the greater potential for not developing the hills in the southeast quadrant and the unnamed creek tributary of East Antioch Creek in the Alternative Plan, there is less potential to uncover archaeological or paleontological resources. Therefore, the Alternative Plan would also have a less than significant impact on cultural resources.

No Project

The existing General Plan does not include the specific policies intended to identify and protect the potentially historic resources in the Planning Area, or the policies which detail the procedure project sponsors must follow upon the discovery of archaeological or paleontological resources. Therefore, the No Project scenario provides less protection for cultural resources than the proposed Plan. However, because of existing General Plan policies related to the protection of cultural resources, which address potential impacts and their mitigation, the citywide impact on cultural resources is less than significant.

GEOLOGY AND SEISMIC HAZARDS

The potential impacts of geological and seismic hazards are considered less than significant under the proposed Plan based on the implementation of existing regulations and a specific policy related to ensuring slope stability.

Alternative Plan

The Alternative Plan includes less overall development than the proposed Plan and may potentially develop less total area, including the steep slopes in the southeast quadrant of the Planning Area. Therefore, there would be less potential for impacts from geological and seismic hazards than the proposed Plan. In addition, the Alternative Plan would be subject to the same existing regulations and proposed policy related to slope stability as the proposed Plan. Therefore the potential impacts of geological and seismic hazards would be less than significant, and less than the proposed Plan.

No Project

The No Project scenario includes less intense development than the proposed Plan and would likely be less impacted by geological and seismic hazards than the proposed Plan. Although the No Project scenario does not include the specific policy related to slope stability, current State and federal regulations require specific engineering and design criteria to avoid impacts related to geologic, soils, and seismic hazards, such that the impacts would be less than significant.

HAZARDOUS MATERIALS AND SAFETY

The proposed Plan would have less than significant impacts on hazardous materials and safety based on the proposed Plan policies and existing regulations. Policies require the investigation and clean-up of contaminated sites. Policies also require services and facilities related to fire prevention and fire protection.

Alternative Plan

The Alternative Plan proposes development throughout the Planning Area similar to the proposed Plan, with the potential exception of the steep slopes in the southeast quadrant that may not develop in the planning horizon. Two of the primary hazardous contamination sites, Chevron Old Valley Pipeline and the TAOC New Love Pump Station Site, are located near the hills. In addition the PDQ Products property is a potentially contaminated site due to the metals processing that has occurred there. In addition, the hills are the location of the majority of the high fire threat areas. The impacts of hazardous materials contamination under the Alternative Plan could be less than in the proposed Plan, since there is less new development that involves excavation of contaminated

soil. However, the proposed Plan includes policies that require the investigation and clean-up of contaminated sites, so it may facilitate more efficient and timely environmental clean-up than under the Alternative Plan. In the Alternative Plan, development would occur near the existing high-pressure petroleum pipeline, but would be subject to the proposed policies and existing regulations which would limit the potential impacts. There could be greater fire hazard impacts with the Alternative Plan due to the difficulties in providing fire protection access in hillside areas. Overall, with Plan policies and existing Federal and State regulations, the hazardous materials and safety impacts would be less than significant under the Alternative Plan.

No Project

The No Project scenario proposes less intense development throughout the Planning Area than anticipated under the proposed Plan. The No Project scenario would not include the specific hazardous materials and public safety policies and implementation measures contained as part of the proposed Plan. However, hazardous materials generation, storage and clean-up are heavily regulated by federal, State, and local regulations that would apply to both the No Project scenario and the proposed Plan. Development is expected to occur on the steep slope areas in the southeast quadrant, therefore the potential impacts of hazardous materials, soil and water contamination, wildfires, and high-pressure petroleum pipelines are similar to those in the proposed Plan.

HYDROLOGY

The impacts of the proposed Plan on local hydrology would be less than significant due to existing regulations and proposed policies which require cooperative flood management planning.

Alternative Plan

The Alternative Plan involves less total development with fewer residents and employees and may not involve the development of the steep slopes and the unnamed creek tributary in the southeast quadrant of the Planning Area. The Alternative Plan would provide the same wetland buffer as the proposed Plan, though it would not be improved with a linear park on both sides. Overall, due to the fewer number of housing units supported in this plan, the number of required open space and park acres would also be fewer, only 8 compared to 25 in the proposed Plan. The Alternative Plan would have the same policies as the proposed Plan which would support permeable surfaces and natural drainage. The lower population and less intense development would produce fewer non-point source pollution impacting stormwater quality. The potential flood hazard risks to structures, private property, and human health and safety would be the same as under the proposed Plan, since in either plan storm drainage facilities will be provided. Overall, hydrologic impacts would be less than significant.

No Project

The No Project scenario would have similar impacts on local hydrology as the Alternative Plan, and less impact than the proposed Plan, since overall the development would be less intense. Even though the existing General Plan does not include the specific policies intended to reduce the amount of impervious surfaces and increase stormwater management cooperation between agencies, the development under the No Project scenario would have less than significant impacts on hydrology.

LAND USE AND POPULATION

The proposed Plan's impacts on land use and population would be less than significant.

Alternative Plan

The Alternative Plan would designate new land uses in the Planning Area. These land use designations would support approximately 650 housing units and 1 million square feet of commercial uses, substantially less, about 70 percent less, than the proposed Plan. Table 4.3-8 summarizes the land use designations under the Alternative Plan. Implementation of the Alternative Plan would not create a land use pattern that would physically divide an established community. In fact, each development scenario serves as infill development, potentially improving the land use integration. The Alternative Plan would not displace substantial numbers of people or housing units.

4.3-8 Alternative Plan Land Use Summary

Land Use	*Acres*	*Percent of Total*
Medium Low Density Residential	14.4	4%
High Density Residential	23.1	6%
Office	34.0	9%
Community Retail	14.3	4%
Mixed Use Neighborhood	59.8	16%
Business Park [1]	63.1	17%
Linear Park [2]	3.5	1%
Public/Institutional – BART Yard	2.8	1%
Public/Institutional – Transit Parking	17.6	5%
Wetlands, Buffer, and Detention Basins	51.8	14%
UP ROW	19.5	5%
Arterial and Collector Roads	10.2	3%
Industrial/Utilities - PG&E Substation	61.2	16%
Total	**375.2**	**100%**

1. About 20 acres of the business park area is considered steep slopes, which may not develop during the planning horizon due to market and cost constraints.

2. Except for the creek-side trail, the locations of the parks have not been defined. The amount of park/open space land is based on the estimated number of residential units and household size, and land would be dedicated.

Source: Dyett & Bhatia, 2008.

The Alterative Plan would be consistent with adopted regional and local plans, including the MTC Resolution 3434 and the BART Expansion Policy. With the existing and proposed housing within a half-mile of the stations on the eBART corridor, there would be almost 8,000 housing units. This would meet the MTC Resolution 3434 requirement of 6,600 units in the corridor.

Table 4.3-9 Alternative Plan Existing and Planned Corridor Housing

	Existing	*Planned*	*Total*
Pittsburg/Bay Point	1,873	1,595	3,468
Railroad Avenue	1,477	1,590	3,067
Hillcrest Median	999	400	1,399
Total	**4,349**	**3,585**	**7,934**

Source: eBART Draft EIR, 2008; ABAG Projections 2005; Pittsburg/Bay Point Specific Plan, 1997; Draft Railroad Avenue Specific Plan, 2008.

No Project

This alternative is already consistent with the City's General Plan, and the impacts of its growth have been anticipated and mitigated by the General Plan EIR. The existing land use designations would support approximately 1,200 housing units and 3.5 million square feet of commercial uses, which would be almost as much total development as the proposed Plan, about 90 percent of the total. Therefore, the No Project scenario would have similar impacts on land use and housing as the proposed Plan.

Table 4.3-10 Planning Area Land Use Designations

Land Use	*Planning Area*	*Percent of Total*
Transit-Oriented Development	73.1	19%
Business Park	241.0	64%
Business Park/Public/Institutional	17.5	5%
Other (PG&E, ROW, etc.)	43.6	12%
Total	**375.2**	**100%**

Source: City of Antioch General Plan (2003), GIS (2007), Dyett & Bhatia (2008)

The No Project scenario would be consistent with adopted regional and local plans, including the MTC Resolution 3434 and the BART Expansion Policy. With the existing and proposed housing within a half-mile of the stations on the eBART corridor, there would be more than 8,700 housing units. This would meet the MTC Resolution 3434 requirement of 6,600 units in the corridor.

Table 4.3-11 No Project Existing and Planned Corridor Housing

	Existing	*Planned*	*Total*
Pittsburg/Bay Point	1,873	1,595	3,468
Railroad Avenue	1,477	1,590	3,067
Hillcrest Median	999	1,200	2,199
Total	**4,349**	**4,385**	**8,734**

Source: eBART Draft EIR, 2008; ABAG Projections 2005; Pittsburg/Bay Point Specific Plan, 1997; Draft Railroad Avenue Specific Plan, 2008.

NOISE

The proposed Plan would have potentially significant and unavoidable noise impacts due to the high levels of anticipated exterior noise near new development in the future. However policies in the Specific Plan limit the impacts to small areas, and compensate for impacts in those areas by requiring lower interior noise levels.

Alternative Plan

The Alternative Plan would have the same policies as the proposed Plan that reduce the noise impacts on new development, particularly interior noise levels. The traffic volumes on the arterials and highways will be slightly less, though freight train activity is expected to be the same as the proposed Plan. In addition, if the hills in the southeastern quadrant are not graded to the same extent as in the proposed Plan, the noise in that area would be less since the hills would dampen highway noise. Therefore, the Alternative Plan noise contours are only slightly smaller than in the proposed Plan. However, there will be less overall development to be subjected to the future noise and vibration levels. Noise impacts will be significant and unavoidable under the Alternative Plan in certain portions of the Station Area, specifically in the western portion of the Station Area north of the railroad line where residential units would be located.

Table 4.3-12 Noise Contour Areas

	Proposed Plan		*Alternative Plan*	
Contour	*Acres*	*Percent of Area*	*Acres*	*Percent of Area*
50 to 55	0.0	0%	0.1	0%
55 to 60	3.4	1%	6.9	2%
60 to 65	103.7	28%	119.7	32%
65 to 70	129.7	35%	126.3	34%
70 to 75	88.0	23%	79.8	21%
75 to 80	35.4	9%	31.2	8%
80 to 85	12.5	3%	9.0	2%
85 to 90	1.9	0%	1.7	0%
Total	**375.2**	**100%**	**375.2**	**100%**

Source: Charles Salter Associates; Dyett & Bhatia, 2008

No Project

The No Project scenario is subject to the noise standards established in the General Plan, which are the same as the noise standards under the Proposed Plan and the Alternative Plan. The traffic volumes on the arterials and highways will be similar to the proposed Plan, since the total amount of development is similar. Freight train activity is expected to be the same as the proposed Plan. However, because more of the development is non-residential, there will be less residential units that will be impacted by high noise levels.

In addition, if the hills in the southeastern quadrant are not graded to the same extent as in the proposed Plan, the noise in that area would be less since the hills would dampen highway noise. Therefore, the No Project noise contours are slightly smaller than in the proposed Plan, and there will be less residential development subjected to the future noise and vibration levels. Noise impacts will be significant and unavoidable under the No Project Scenario in certain portions of the Station Area, specifically in the central portion of the Station Area north of the railroad line where residential units would be located in the Transit-Oriented Development land use designation.

PUBLIC SERVICES

The proposed Plan will have less than significant impacts on public services because it will: provide adequate open space; pay the appropriate impact fees for fire service and schools; and not require substantial numbers of new police officers.

Alternative Plan

The provision of public services is entirely contingent on new housing units and population in the Planning Area. Because the Alternative Plan supports less than a quarter of the housing units and about a third of the population as the proposed Plan, the potential impact on public services is much less. The Alternative Plan would be required to provide adequate open space for the new population. The new population would contribute to the overcrowding elementary schools as the proposed Plan does, but project sponsors are required to pay school impact fees to help address this concern. Because the Planning Area is outside the existing service areas for the Contra Costa Fire District, the impact fees paid by the project sponsors will contribute to either a new fire station or increasing service capabilities of an existing station. The lower anticipated buildout population would require fewer police officers, only about two officers, instead of the six required by the greater population of the proposed Plan. Overall, similar to the proposed Plan, the public services impacts will be less than significant, because the development will need to provide or pay impact fees to support public services.

No Project

The provision of public services is entirely contingent on new housing units and population in the Planning Area. The No Project scenario supports approximately half the housing units and population as the proposed Plan. Based on the existing General Plan and the Antioch Municipal Code, the No Project scenario would be required to provide adequate open space for the new population. The new population would contribute to the overcrowding elementary schools as the proposed Plan does, but project sponsors are required to pay school impact fees to help address this concern. Because the Planning Area is outside the existing service areas for the Contra Costa Fire District, the impact fees paid by the project sponsors will contribute to either a new fire station or increasing service capabilities of an existing station. The lower anticipated buildout population would require fewer police officers, only about three officers, instead of the six required by the greater population of the proposed Plan. Overall, similar to the proposed Plan, the public services impacts would be less than significant, because the development will need to provide or pay impact fees to support public services.

UTILITIES

The proposed Plan will have less than significant impacts on utilities because: the water supply has been identified as being sufficient, as are the solid waste landfill capacity and energy generation capacity. The Plan provides for the necessary improvements to the water distribution, wastewater collection, and stormwater management systems to be built as part of the future projects; and, project sponsors will pay impact fees to help fund any necessary improvements to the water and wastewater treatment facilities.

Alternative Plan

During the implementation of the Alternative Plan, the necessary utility improvements would be installed and adequately funded through impact fees. Because the number of housing units and density of development is lower in the Alternative Plan as compared to the proposed Plan, the impacts on utilities will also be less. The projected development under Alternative Plan would require approximately 319,000 gallons of potable water per day (358 acre feet per year), or about a third of the proposed Plan's estimated water use. The estimated wastewater flow for the projected development under the Alternative Plan is approximately 211,000 gallons per day, without any peaking factors applied. This would be less than half of the wastewater generated by projected development under the proposed Plan, but more than 30 percent less than the No Project Scenario analyzed in the *2003 Wastewater Collection Master Plan*. Therefore the planned improvements of the existing collection system are likely to be sufficient. The stormwater runoff generated has the potential to be less than the proposed Plan if the hills in the southeast quadrant are not developed during the planning horizon. Overall, the Alternative Plan would require fewer utilities improvements than the proposed Plan. Similar to the proposed Plan, the utilities impacts would be less than significant, because the development will need to provide or pay impact fees to support utilities infrastructure.

No Project

Like the proposed Plan and the Alternative Plan, during the implementation of the No Project scenario, the necessary utility improvements would be installed and adequately funded through impact fees. Because the number of housing units and density of development is lower in the No Project scenario as compared to the proposed Plan, the impacts on utilities will also be less. The No Project scenario would require approximately 456,000 gallons per day (511 acre feet per year), about half of the proposed Plan's water demand. The estimated wastewater flow for projected development of the No Project scenario is approximately 311,000 gallons per day, without any peaking factors applied, which is about 73 percent estimated flow generated by development under the proposed Plan. The *2003 Wastewater Collection Master Plan* was based on the land uses in the General Plan, therefore the planned improvements of the existing collection system would be sufficient. The stormwater runoff generated by development of the No Project scenario will be similar to the proposed Plan, if not more since the General Plan does not include the policies to reduce runoff more than required by the existing regional requirements. Overall, the No Project would require fewer utilities improvements than the proposed Plan. Similar to the proposed Plan, the utilities impacts would be less than significant, because the development will need to provide or pay impact fees to support utilities infrastructure.

4.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines require the identification of an environmentally superior alternative among the alternatives analyzed. Further, CEQA Guidelines §§15126.6(e)(1), 15126.6(e)(2) state that the EIR shall identify an "environmentally superior" alternative based on the comparative analysis among project alternatives (but not including the No Project Alternative).

Overall, the Alternative Plan would have the least environmental impact of the alternatives that were evaluated due to its lower development density and least amount of population and jobs. However, there would be significant environmental impacts related to circulation and noise and the Alternative Plan does not achieve the objectives for the Hillcrest Station Area as effectively as the proposed Plan.

The benefits of less intensive development are derived from exposing fewer people and less development to environmental hazards such as flooding, earthquakes, fires, etc. and potentially using fewer resources to construct and operate the development. Under the Alternative Plan, the hills in the southeastern quadrant of the Planning Area may not be developed during the planning horizon; however, development in this area is not precluded. Maintaining the hills and the unnamed creek tributary would decrease potential impacts of most of the environmental topics analyzed. Less intensive development would require fewer public services and less water, energy, and overall infrastructure.

On the other hand, the Alternative Plan does not achieve some of the primary objectives of the Hillcrest Station Area Specific Plan, such as creating an employment center; generating transit ridership; and minimizing impacts on regional highway facilities. The Alternative Plan would support 60 percent fewer jobs than the proposed Plan. Even though the jobs per housing unit ratio would be higher, the 2,300 jobs supported by the land uses in the Alternative Plan would account for less than 6 percent of the City's total employment. The General Plan land uses for the Planning Area would support more than 4,000 jobs, and the Specific Plan objective is to accommodate at least 5,000 jobs. Therefore, the Alternative Plan does not meet the City's goal of creating an employment center near transit and regional road network.

Another important goal of the Hillcrest Specific Plan is to serve as the Ridership Development Plan for the eBART project. The land uses are to generate ridership and support the large public investment. The Alternative Plan would only generate about 7 percent of the total eBART ridership projected for the Hillcrest Station, as compared to the proposed Plan, which will generate about 25 percent of the ridership. Therefore, the majority of the riders will be driving or taking the bus to the station, exacerbating traffic congestion and increasing parking demand.

Most critically, the Alternative Plan does not mitigate for the traffic impacts it would have on the local and regional roads. The land use and circulation plans are not as well integrated and traffic congestion is not as well mitigated as in the proposed Plan. The Alternative Plan creates 55 percent fewer daily automobile trips, but the resultant traffic congestion is projected to be much worse than under the proposed Plan. The operations of four intersections and freeway operations on SR 4 would fail under the Alternative Plan. The less intensive development also means that there is a lower internal trip capture rate, which results in a higher than average vehicle miles traveled VMT per resident and employee than the proposed Plan. Therefore, the reductions in traffic congestion, air pollution and greenhouse gas emissions, and noise are not proportionate with the reduction in population.

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5 CEQA Required Conclusions

This section summarizes significant unavoidable, irreversible, growth-inducing, and cumulative impacts, as required by California Environmental Quality Act (CEQA) Guidelines.

5.1 GROWTH-INDUCING IMPACTS

The EIR must examine the potential growth-inducing impacts of the proposed Hillcrest Station Area Specific Plan. More specifically, CEQA Guidelines require that the EIR "discuss the ways in which the proposed Plan could foster economic or population growth, or the construction of additional housing, either directly or indirectly" (CEQA Guidelines §15126.2(d)). This analysis must also consider the removal of obstacles to population growth, such as improvements in the regional transportation system.

PROJECTED GROWTH

Growth-inducing impacts over an extended time period are difficult to assess with precision, since future economic and population trends may be influenced by unforeseeable events, such as natural disasters, and business and development cycles. The Association of Bay Area Governments (ABAG) is responsible for making long-term, realistic forecasts of population, households, and employment which are based on historic trends, as well as emerging trends in markets, demographics, and local policies (ABAG, 2007). Regional and local jurisdictions and agencies use ABAG projections to guide planning efforts. The current ABAG 2007 Projections indicate that in 2035 the population could be 128,400 in 43,270 households. The projected employment is 40,800 jobs.

Table 5.1-1 City of Antioch Projected Growth

	Population		*Households*		*Employment*		
Year	*Number*	*Percent Growth*	*Number*	*Percent Growth*	*Number*	*Percent Growth*	*Jobs/ Household*
2005	101,500	12%	32,760	12%	20,510	4%	0.63
2010	106,000	4%	34,560	5%	22,680	11%	0.66
2015	110,400	4%	36,360	5%	25,930	14%	0.71
2020	115,000	4%	38,090	5%	29,350	13%	0.77
2025	119,600	4%	39,890	5%	33,000	12%	0.83
2030	124,000	4%	41,580	4%	36,750	11%	0.88
2035	128,400	4%	43,270	4%	40,800	11%	0.94
2005-2035 Annual Growth Rate	0.8%		0.9%		2.3%		

Source: ABAG Projections 2007; Dyett & Bhatia, 2008

However, it is likely that citywide growth will be less than the current projections, because there has been a substantial downturn in the economy. The City's historical growth rate indicates that the economic slowdown began to be seen in 2004. Based on the 2005-2035 projected annual growth rate of 0.8 percent and the California Department of Finance 2008 population estimate, the 2035 population would only be about 125,000.

The proposed Specific Plan is not considered growth-inducing. Even though the Specific Plan allows more total development and residential units in the Planning Area than the existing land use regulations, that growth will be the result of redistribution from other areas of the City rather than an addition to the growth estimated under the regional ABAG projections. Based on case studies from around the country, the implementation of rail transit generally affects the timing, location, and density of how development is accommodated in the City, but it does not affect the underlying market demand and regional growth projections. Thus in Antioch, residents and office tenants may choose to locate in the Planning Area near transit and the freeway rather than in other areas of Antioch. However the total amount of market demand in Antioch and East County will not change as a result of the eBART rail transit and the proposed transit-oriented development around the station.

The utilities infrastructure that will be built in the Hillcrest Station Area under the Specific Plan is designed to serve the new development in the Station Area. None of the infrastructure components are proposed to provide greater amounts of capacity than is required by the new development. Therefore the infrastructure proposed as part of the Station Area plan is not growth inducing. There is one sewer line that will need to be installed in the Planning Area that serves development outside the Planning Area; however this line is already planned in the City's 2003 Wastewater Collection System Master Plan.

The roadway infrastructure that is proposed in the Specific Plan is consistent with roadway improvements in the City of Antioch General Plan, and therefore is not growth-inducing beyond what the City has already decided as part of its long-term Citywide Plan. The major roadways proposed in the Hillcrest Station Area include the extensions of Viera Avenue, Slatten Ranch Road, Oakley Road, and Phillips Lane. These roadways are included in the City of Antioch General Plan.

The regional circulation improvements discussed in the proposed Plan are improvements that have been under study for a long time in East Contra Costa County, and are already listed in the Regional Transportation Plan. These include: the Hillcrest Interchange improvements, the SR 4 widening, the construction of eBART, and the construction of Phillips Lane Interchange. Thus these improvements are not new growth-inducing components of the Specific Plan, but rather are a part of ongoing regional transportation planning for the County.

5.2 CUMULATIVE IMPACTS

CEQA requires that the EIR examine cumulative impacts. As discussed in CEQA Guidelines §15130(a)(1), a cumulative impact "consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." The analysis of cumulative impacts need not provide the level of detail required of the analysis of impacts from the project itself, but shall "reflect the severity of the impacts and their likelihood of occurrence" (CEQA Guidelines §15130(b)).

In order to assess cumulative impacts, the EIR must analyze either a list of past, present, and probable future projects or a summary of projections contained in an adopted general plan or related planning document. In conducting the analysis for this EIR, ABAG population and employment projections for the City of Antioch were reviewed. (See above.)

It is important to note that the proposed Hillcrest Station Area Specific Plan is essentially a set of projects, representing the cumulative development scenario for the reasonably foreseeable future in the Planning Area. Therefore, the analysis presented in Chapter 3 represents a cumulative analysis of the Planning Area as a whole, over the next 26 years.

The air quality, circulation, climate change, and noise analyses evaluate the future development scenario as a whole, with the projected Specific Plan development and proposed transportation system applied to projected future growth in the region. Therefore, for these four issue areas, analysis of the proposed Specific Plan contained in Chapter 3 of this EIR represents both the project impacts and cumulative effects. Refer to sections 3.4 Circulation & Traffic, 3.2 Air Quality, 3.5 Climate Change& Energy, and 3.11 Noise. In addition, Section 3.3 Biological Resources and Section 3.9 Hydrology & Water Quality include separate discussions of the cumulative effects in these issue areas.

Other cumulative impacts would include:

- ***Aesthetics & Visual Resources***. Buildout under the proposed Plan would change the existing visual character of the Planning Area. New development under the Specific Plan will change the Planning Area's existing undeveloped condition by replacing open grassland and hillsides with new transit-oriented development. In the final built condition of the project, extensive landscaping and public spaces will be added, and key natural features will be preserved. There are not any other probable future projects that are planned in the Planning Area or adjacent areas that will detract from aesthetics and visual resources. Vacant sites adjacent to the Planning Area are zoned for single-family home development. As such, cumulative impacts to visual resources would be less than significant.
- ***Cultural Resources***. A records search verified that there are no known or listed cultural resources in the Planning Area. Proposed Specific Plan policies require additional research to evaluate the eligibility of, and subsequent mitigation of, potential historic resources. Adopted General Plan policies require protocols that ensure that cultural or paleontological resources would be mitigated should accidental discovery of such resources occur. Significant resources that could be affected by construction activities would be avoided, or if this is not possible, recovered for scientific value. Research about cultural resources did not indicate any additional projects that remove or alter cultural resources in the surrounding area or the City

of Antioch, such that historical, archeological, or paleontological resources would be permanently lost. Therefore, the cumulative impacts to significant cultural or paleontological resources are expected to be less than significant.

- ***Geological and Seismic Hazards.*** All future projects considered under the proposed Plan would be required to comply with seismic requirements contained in the California Building Code, the City of Antioch Municipal Code, adopted General Plan and proposed Specific Plan policies. Implementation of the proposed Plan is not expected to result in an increase in seismic impacts, including those impacts related to emergency services, or geological hazards. In addition, future projects in the Planning Area would be required to comply with NPDES General Construction Permit requirements, so erosion impacts should be less than significant. Overall cumulative impacts pertaining to geology, soils and seismic hazards would be less than significant.
- ***Hazardous Materials and Safety.*** Future development of the Planning Area, as proposed by the Hillcrest Station Area Specific Plan, could improve existing issues associated with soil and groundwater contamination. Any necessary remediation would be completed prior to construction and, by law, future land uses must abide with the most recent laws and regulations regarding hazardous material use, generation, transport, storage, and disposal. In addition, development within the Planning Area is likely to reduce the risk of wildland fires for the surrounding area by providing improved access and circulation throughout the Study Area.

  Compliance with adopted General Plan policies and proposed Specific Plan policies would ensure that fire and emergency services would be adequate to meet the demand created by new development. Therefore there would not be a contribution to a deficit in emergency services for the City of Antioch. In addition, compliance with proposed Specific Plan policies would reduce the risks inherent in allowing construction and development near high-pressure petroleum pipelines. As such, cumulative impacts pertaining to hazardous materials and safety would be less than significant.
- ***Land Use.*** The proposed Plan would result in less than significant land use impacts, and all future projects under regional and proposed Plan buildout would be required to mitigate their respective land use impacts. Therefore, the incremental impact of the proposed Plan, when considered in combination with buildout of the region would not result in cumulatively significant impacts related to land use.
- ***Public Services and Facilities***. The public services and facilities components of the Hillcrest Station Area Specific Plan have cumulative effects but these are not significant, as they respond to the City's adopted standards.
  - **Fire and Emergency Services**. There is no existing fire station that could serve the projected development within the Planning Area and meet the response time standard. Compliance with adopted General Plan policies and proposed Specific Plan policies ensure that a new fire station, or improved access to an existing fire station will be constructed to provide adequate fire and emergency services. The addition of a new fire station or improved access to existing stations will benefit the surrounding Study Area, in addition to serving the Planning Area. Thus the impact on fire facilities resulting from the Hillcrest Station Area Specific Plan and other projects in this region would not create a significant cumulative impact. The Fire District collects impact

fees for new facilities, which will ensure that this project and projects in the surrounding area pay their fair share of the costs for the needed capital improvements.

- **Police Services**. Based on the population projections for 2035, the City of Antioch will require a police force of at least 154 officers, which entails hiring approximately 10 new officers. Of these 10, approximately six would be needed to serve the Planning Area. Proposed Plan policies ensure that the tax revenues from planned development would support the cost of new police services or an additional funding source is identified. Therefore, the cumulative impact on police services would be less than significant.
- **Schools**. New housing in the City combined with residential development in the Planning Area may require the construction or expansion of an elementary school. However, the General Plan and City regulations require that new development provide necessary funding and/or capital improvements to mitigate projected impacts on school facilities. Antioch Unified School District policies require that developers pay school impact fees for new construction of residential units and commercial space. Therefore, the cumulative impact on public schools will be less than significant.
- **Parks**. New development would provide required park-land to serve its residents and as such there would be adequate parks and recreation facilities provided. Thus there will be no significant cumulative impact. Moreover, the trail facilities proposed in the Specific Plan would be available to all City residents, and would provide an extension of the citywide trail system, and thus there is a beneficial cumulative impact as a result of the project.
- **Community Center Space**. Compliance with General Plan and proposed Specific Plan policies will ensure that the City adopted standard of 750 square feet of community space per 1,000 residents is met or exceeded for projects within the Planning Area. Therefore, the cumulative impact is less than significant.

- ***Utilities***. Future development projects resulting from the proposed Specific Plan will cause an increase in population and density of development, with a resultant increase in sewer flows, water demands, stormwater runoff, and solid waste generation. Infrastructure improvements, including water mains, sewer mains, and storm drainage lines, will alleviate deficiencies in distribution and collection capacity brought on by new development. Further, future development projects in Antioch would be required to mitigate impacts on utilities and service systems on a project-by-project basis. As such, overall cumulative impacts pertaining to utilities systems would be less than significant.

5.3 IRREVERSIBLE ENVIRONMENTAL CHANGES

The EIR must also examine irreversible changes to the environment. More specifically, CEQA Guidelines require the EIR to consider whether "uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely" (CEQA Guidelines §15126.2(c)). "Nonrenewable resource" refers to the physical features of the natural environment, such as land, waterways, etc.

WATER CONSUMPTION

New development under the proposed Specific Plan will increase the demand for public water. The pace of the City of Antioch's growth is in large part dependent on its ability to provide adequate public facilities and services. Additional development and the resulting population and employment increases will result in a permanent increase of water consumption, which represents an irreversible environmental change.

ENERGY RESOURCES

New development under the proposed Specific Plan would result in the commitment of existing and planned sources of energy, which would be necessary for the construction and daily use of new buildings and for transportation. Buildings use electricity, natural gas, and petroleum products for power, lighting, heating, and other indoor and outdoor services, while transportation induced by development uses both oil and gas. Use of these types of energy for new development even with the proposed energy conservation and green building policies would result in the overall increased use of nonrenewable energy resources. This represents an irreversible environmental change.

CONSTRUCTION-RELATED IMPACTS

Irreversible environmental changes could also occur during the course of constructing development projects made possible by the proposed Specific Plan. Beyond the energy, fuel and water consumption impacts of construction described separately above, new construction would also result in the consumption of building materials, many of which are still made from non-renewable resources. This represents an irreversible environmental change.

5.4 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

According to CEQA Guidelines 15126(b), an EIR must discuss any significant environmental impacts that cannot be avoided under full implementation of the proposed program. Also, this EIR must discuss why the program is being proposed, not withstanding such impacts. The proposed policies of the Hillcrest Station Area Specific Plan described in Chapter 3 in the EIR would avoid or eliminate most potentially significant impacts. However, two impacts classified as significant and unavoidable have been identified in the issue areas of circulation and noise.

The Hillcrest Station Area Plan is being proposed because it achieves many goals for the City and the East County area that outweigh the potential significant and unavoidable impacts on traffic and noise. These goals include:

- Construction of the eBART line to provide transit service to East County;
- Location of residential and employment near the Hillcrest eBART station to generate ridership that supports the operation of eBART;
- Provision of a range of housing types not currently available in Antioch, which increases the diversity and affordability of housing in Antioch;
- The creation of pedestrian-oriented centers with shops, retail, and restaurants, and entertainment uses, which serve the entire City and improve the quality of life for all residents; and
- Creation of jobs in Antioch through the provision of large office development sites in close proximity to the freeway and eBART.

CIRCULATION

Intersection Operations

Implementation of the proposed Hillcrest Station Area Specific Plan would result in two intersections operating at less than the adopted standard: Hillcrest Avenue at East Tregallas Drive/Larkspur Avenue intersection and Hillcrest Avenue at SR 4 Eastbound Ramp intersection. The City has considered additional measures to comply with the LOS criteria at these two intersections. Measures considered include realigning Tregallas Drive and Larkspur Avenue to the south to improve vehicle storage between this intersection and the SR 4 eastbound off-ramp intersection. This change was determined to be infeasible during the planning horizon because it would require the acquiring and demolition of active and viable commercial properties, residential properties, and a church south of the Planning Area. Other measures considered, such as realigning the Hillcrest Avenue corridor and/or constructing new/modified ramps to/from SR 4 eastbound, would have similar right-of-way impacts.

Two other intersections have the potential to have significant and unavoidable impacts: the Hillcrest Avenue/East 18th Street intersection and the Neroly Road/Oakley Road intersection. Both of these intersections are outside the Planning Area and beyond the scope of the defined project. The proposed Specific Plan includes policies to support improving the operations of these intersections, but if improvements are not made than these two intersections would also operate at unacceptable LOS E or F conditions in 2035 with buildout of the Specific Plan.

Freeway Operations

There are also potential significant and unavoidable impacts to freeway operations due to the implementation of the eBART project, regional growth, and the Hillcrest Station Area Specific Plan. By 2035, due to the eBART project and regional growth, it is projected that freeway traffic will experience delay indexes of up to 3.3, traveling at 21 miles per hour average speed. The addition of development in the Hillcrest Station Area would exacerbate this congestion even further.

The construction of the SR 4/Phillips Lane Interchange has been identified by the City as the most feasible solution. If a new interchange is implemented, the delay index would remain the same or improve in the AM peak hours, and worsen only slightly in PM peak hours. This mitigation would allow the freeway to operate within the adopted standards.

The City has considered measures to address the severe traffic congestion at the Hillcrest Avenue Interchange beyond those identified in the SR 4 East Widening Project including additional ramp widening, alternative interchange configurations, and realigning local roads to improve interchange efficiency. These changes would all require the acquiring and demolition of active and viable commercial properties, residential properties, and a church south of the Planning Area. The alternatives were considered infeasible given the substantial impact to the right-of-way.

NOISE

The current City standards state that development near SR 4, the SR 4 Bypass, and the eBART project may not result in increases greater than five CNEL above existing noise levels. Four locations within the Planning Area exceed this standard. Each of these locations is adjacent to the Union Pacific Mococo railroad, and freight rail will be the primary noise source. If Union Pacific resumes freight rail service on the Mococo line, and if no grade separation is provided at Hillcrest Avenue, the noise impacts are significant. However this impact is due to the resumption of rail service, and is not an impact of the Specific Plan.

There are mitigation actions that could reduce the noise levels to a less than significant level. The grade separation at Hillcrest Avenue and the Union Pacific rail line, and a grade separation lowering the elevation of the rail line itself into a below-grade channel, would mitigate the noise impact. However since those projects are not within City control, and there is no identified funding source, these cannot be assumed as mitigations. Therefore the impacts of the railroad line noise on the proposed development under the Specific Plan are significant and unavoidable.

The policies of the Specific Plan ensure that noise impacts are mitigated to the maximum extent feasible, and that in areas where exterior noise levels cannot be met, interior noise levels are reduced below the minimum standard in order to compensate for the noise in exterior spaces.

5.5 IMPACTS FOUND NOT TO BE SIGNIFICANT

CEQA requires that an EIR provide a brief statement indicating why various possible significant impacts were determined to be not significant. Chapter 3 of this EIR discusses all potential impacts, regardless of their magnitude. A similar level of analysis is provided for impacts found to be less than significant as impacts found to be significant. Significance of an impact is assessed in relation to the significance criteria provided in each section in Chapter 3. A summary of all impacts is provided in the Executive Summary of this EIR.

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