Petaluma General Plan 2025

Draft Environmental Impact Report

STATE CLEARINGHOUSE NO. 2004082065

Prepared for

City of Petaluma

by

DYETT & BHATIA
Urban and Regional Planners

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Table of Contents

Technical Appendices List

List of Tables

List of Figures

Executive Summary

This Draft Environmental Impact Report (DEIR) evaluates the potential impacts of the proposed City of Petaluma General Plan 2025. The proposed General Plan was developed in response to policy direction provided by the City Council and the Planning Commission as well as community concerns identified through an extensive public participation and outreach program, including newsletters, community workshops, and public meetings. The City of Petaluma 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. The EIR also identifies mitigation measures to minimize significant impacts and evaluates reasonable alternatives to the proposed project that may reduce or avoid one or more significant environmental effects. These alternatives must include a "No Project" alternative that represents the result of not implementing the project and a range of reasonable alternatives to the project, which would feasibly attain most of the basic objectives but would avoid or substantially lessen any of the significant effects of the project.[1] Based on the alternatives analysis, an environmentally superior alternative is identified.

This EIR is a program EIR that examines the potential effects resulting from implementing designated land uses and policies in the proposed General Plan. The impact assessment evaluates the General 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 project-specific impacts. Any future development project made possible by the General Plan will be subject to individual, site-specific environmental review, as required by State law.

E.1 PROPOSED PROJECT

The proposed Petaluma General Plan 2025 is intended to replace the existing General Plan, which was adopted in 1987. The General Plan is comprised of goals, policies, programs, a land use map, and other graphic figures and maps (e.g., open space systems, a transportation network, and public facilities) to guide future development within the City's boundaries, through the year 2025. The proposed General Plan includes the seven elements required by State law (Land Use, Housing, Circulation, Open Space, Conservation, Noise, and Safety) as well as four optional elements that address local concerns (Community Design; Community Facilities and Services; Water Resources; and Economic Health and Sustainability). The Housing Element was adopted and certified by the State in 2002 and is not subject to analysis in this EIR. No amendments to this element are proposed as part of this General Plan update.

Petaluma is located in southwestern Sonoma County, just north and east of the Marin County border. Petaluma's boundaries are defined by the surrounding landscape—the city originated along the banks of the Petaluma River, then spread outward over the floor of the Petaluma River

1. CEQA Guidelines §15126.6 (a)

Valley. The Valley itself is defined by Sonoma Mountain on the northeast and by the hills extending northward from Burdell Mountain on the west. To the south are the Petaluma Marshlands and beyond, the San Francisco Bay. The Petaluma River and U.S. Highway 101 divide the city on a north/south axis. U.S. 101 is an important north-south transportation route for the region, connecting the San Francisco Bay Area to Mendocino and Humboldt Counties.

KEY ISSUES OF THE PROPOSED GENERAL PLAN

Through discussions with the various elected and appointed City officials and numerous interested residents, five key issue areas emerged as the plan took shape; proposed General Plan policies have been developed to respond to these topics in an integrated manner:

Economic Health. Ensuring diversity and balance of economic activities is essential to the economic health and fiscal sustainability of Petaluma. Of particular concern is the need to provide opportunities for new retail businesses not presently available within the city. The Leakage and Sustainable Retail Strategy Study (2004) identifies specific occupancy types as the "missing pieces" in Petaluma's retail mix, such as electronics, furniture, appliance and upper-end apparel, mixed-use centers and walking access to neighborhood retail. The policies and programs in the Economic Health and Sustainability Element of the General Plan would provide specific direction for ensuring that retail diversity and intensification, as well as continued development of a diverse employment base is achieved.

Infill/Residential Growth Projection. Petaluma has been a pioneer in managed growth. Identifying land use designations and policies to provide an acceptable level of residential growth to complement the desired expansion of employment and retail opportunities and providing for a balance of housing opportunities over the next 20+ years would be a critical component of the proposed General Plan. Given the limited availability of land within the city's UGB, an increase in residential densities in select areas of the remaining supply of vacant and underutilized lands and redefining existing uses would be central aspects of this Plan. In addition, the General Plan, in conjunction with the Central Petaluma Specific Plan (CPSP), would increase the amount of higher density mixed use projects, providing a significant amount of housing in the central area of the community with less consumption of land.

Water Resources. Public workshops on water resources identified common themes regarding management of surface water systems (i.e., creeks and rivers), including restoring wildlife habitat, keeping rivers and channels clean and free flowing, providing bicycle and walking paths along creeks and rivers, and minimizing flooding potential by providing greater capacity within and adjacent to the river channel. The City has and continues to put forth significant efforts, including the adoption and implementation of the River Access and Enhancement Plan. The limited supply of water and the maintenance of an aging water distribution system were analyzed to ensure the ability to meet the future demands of the community. In 2001, the City Council directed the preparation of Water Resource Master Plans in conjunction with the proposed General Plan. Those work efforts have framed the preparation of the Water Resources Element of the General Plan. The Element provides the general objectives to ensure all city water systems meet the present and future needs of the community, in an environmentally sensitive manner.

Mobility. The Petaluma River, Northwest Pacific Railroad, and U.S. 101 traverse the city in close proximity to one another dividing the city into eastern and western segments. Cross-town connections between these two segments are extremely limited, and the connecting roadways are major points of congestion. The Plan would focus on new linkages, as well as on reducing automobile dependence by supporting alternative modes of transportation, such as walking, bicycling, and transit, and promoting utilization of infill sites for diversified neighborhood-serving land uses.

Public Facilities and Parks. The Plan would address the capability of existing city infrastructure (parks, community centers, cultural resources and amenities) to serve the 2025 community by weighing it against the physical and fiscal reality of providing expanded facilities, both passive and active.

In addition, the General Plan contains 14 Guiding Principles that helped form the basis for the detailed goals, policies and programs of the General Plan. The 14 Guiding Principles include:

1. *Maintain a close-knit, neighborly, and family-friendly city.*
2. *Preserve and enhance Petaluma's historic character.*
3. *Preserve and enhance Petaluma's natural environment and distinct setting in the region—a community with a discrete edge surrounded by open space.*
4. *Enhance the Petaluma River corridor while providing recreational and entertainment opportunities, including through active implementation of the Petaluma River Access and Enhancement Plan.*
5. *Stimulate and increase public access and use of pathways as alternative transportation routes by providing a safe, efficient, and interconnected trail system.*
6. *Provide for a range of attractive and viable transportation alternatives, such as bicycle, pedestrian, rail, and transit.*
7. *Enhance Downtown by preserving its historic character, increasing accessibility, and ensuring a broad range of businesses and activities and increasing residential opportunities.*
8. *Foster and promote economic diversity and opportunities.*
9. *Expand retail opportunities to meet residents' needs and promote the city's fiscal health, while ensuring that new development is in keeping with Petaluma's character.*
10. *Continue efforts to achieve a jobs/housing balance, emphasizing opportunities for residents to work locally.*
11. *Foster a sustainable community in which today's needs do not compromise the ability of the community to meet its future needs. Promote green development.*
12. *Ensure infrastructure is strengthened and maintained.*
13. *Integrate and connect the east and west sides of town.*
14. *Encourage cultural, ethnic, and social diversity.*

ESTIMATED BUILDOUT OF THE PROPOSED GENERAL PLAN

Full development under the proposed General Plan is referred to as "buildout." Although the proposed General Plan applies a 20-year 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 use necessarily mean the site will be built/redeveloped with that use in the next 20 years. Refer to the Land Use Element of the proposed General Plan for a more detailed analysis of General Plan buildout.

This section describes the implications of the proposed General Plan buildout in terms of future new population, housing units, and jobs based on land use designations on the proposed Land Use Map. Adequate land is provided by the proposed General Plan to accommodate anticipated housing and job needs in Petaluma through 2025.

Residential and Non-Residential Development

Tables ES-1 and ES-2 compare the additional housing units and non-residential building area expected to occur under the proposed General Plan buildout. As shown, the proposed General Plan will result in approximately 6,000 additional housing units for a total buildout of 27,949 units. The Plan is also intended to accommodate an additional 6.1 million square feet of non-residential space, resulting in approximately 23 million square feet of non-residential floor area in Petaluma. Development under the proposed Plan represents a 27 percent increase in housing units and about 36 percent increase in non-residential building area based on existing, approved development, and development planned under the Central Petaluma Specific Plan (CPSP), and future development under the proposed General Plan.

ES-1: Estimated Housing Units at Plan Buildout

Existing Units (2005)	21,944
Increase to Buildout[1]	6005
Total Housing Units	**27,949**

1. Includes those sites where projects are currently under construction, approved, or in formal review.

ES-2: Non-Residential Development at Plan Buildout (sq. ft.)

	Existing 2005	*Increase to Buildout*[1]	*Total at Buildout*
Commercial/Retail	4,195,000	2,871,000	7,066,000
Office	5,965,000	2,681,000	8,646,000
Industrial	5,291,000	574,000	5,865,000
Institutional	1,406,000	—	1,406,000
Total	**16,857,000**	**6,126,000**	**22,983,000**

1. Includes pipeline projects as well as development proposed under the Plan.

Population and Employment

Table ES-3 summarizes the buildout population and employment under the proposed General Plan. These projections are based on estimates of housing units and non-residential floor area. At buildout, Petaluma will have added approximately 15,600 residents to the city, reaching a total buildout population of 72,707. This represents an overall annual growth rate of about 1.2 percent over the next 20 years, a slower rate than that experienced by the city over the last 20 years (1.8%). Petaluma's population grew by 41 percent between 1985 and 2005; the proposed General Plan represents a 27 percent increase over the next 20 years.

Along with population growth, non-residential building space in Petaluma will increase from an estimated current 16.9 million square feet to 23 million square feet at buildout (an increase of 36 percent), accommodating a comparable increase in employment—from 33,160 currently to 46,540 at buildout (an increase of 40 percent).

A city's job/housing ratio (jobs to employed residents) would be 1:1 if the number of jobs in the city equaled the number of employed residents. In theory, such a balance would eliminate the need for commuting. As shown in Table ES-3, the current jobs/housing ratio in Petaluma is 1.12, meaning that the number of jobs in the city exceeds the number of employed residents by about 12 percent. Despite this, the 2000 Census shows that the majority (over 60 percent) of employed residents continue to commute to work outside the city. While the jobs/housing ratio expected at Plan buildout will decrease to 1.05, the General Plan seeks to improve this balance by providing a diversity of employment opportunities within the city as well as by providing for alternative modes of travel.

Table ES-3: Population and Employment

	Estimated 2005	*Increase to Buildout*	*Buildout 2025*
Population			
Total Population	57,085	15,622	72,707
Household Population	56,286	15,402	71,689
Total Jobs	**33,160**	**13,380**	**46,540**
Jobs/Housing Balance			
Employed Residents	29,700	14,750	44,450
Jobs/Employed Residents Ratio	1.12		1.05

Assumptions: 5% housing vacancy rate; 2.7 persons per household; household population as 98.6% of total population.
1. Population estimate includes all areas within the UGB.

Source: City of Petaluma 2006, Dyett & Bhatia, 2006.

E.2 ALTERNATIVES TO THE PROPOSED GENERAL PLAN

The following alternatives are described and evaluated in this EIR:

ALTERNATIVE 1: NO PROJECT ALTERNATIVE

CEQA requires that one of the alternatives be a "No Project" alternative. The No Project alternative represents the case in which the proposed project – the 2025 General Plan – is not adopted by the City of Petaluma. In the absence of the proposed project, the existing 1987 General Plan and zoning would continue to guide the city's development. Full buildout of the existing General Plan would include both currently approved projects, plus additional development permitted by the Plan in the future. Under this alternative, new development would be limited to generally vacant, developable sites within the existing Planning Area. Major redevelopment is not anticipated or included.

ALTERNATIVE 2: ARTERIAL INFILL CORRIDOR DEVELOPMENT FOCUS

This alternative would intensify uses along the arterial corridors leading to Downtown and Central Petaluma through infilling or re-using vacant and underutilized parcels. Mixed Uses featuring ground-floor retail and residential and/or commercial uses on upper floors would replace underutilized sites along Washington Street and Petaluma Boulevard North. Regional commercial uses would be concentrated at the Highway 101 interchanges with Old Redwood Highway, Rainier Avenue, and East Washington Street. In addition, Business Park uses would be increased in existing business park clusters along North McDowell Boulevard and Lakeville Highway and new business parks would be located northwest of the Highway 101/Lakeville Highway interchange.

Residential development under this alternative would include Mixed Medium and High Density Residential uses along Petaluma Boulevard North frontages, while Low Density and Suburban residential uses would be located on vacant sites to the west. The western and southern hills would remain relatively rural in nature, with infill occurring at a maximum of quarter-acre density, and the Urban Separator would be extended to buffer hillside residences at the UGB's edge.

Transportation improvements under this alternative would emphasize cross-town connections. Rainier Avenue would be extended from McDowell Boulevard North to Petaluma Boulevard North with an underpass and full interchange at Highway 101, Petaluma Boulevard North would be expanded to connect with Highway 101 and the River, Caulfield Lane would be expanded across the River to Petaluma Boulevard South to create a cross-town connection for the southern portion of the City, and the northwestern end of Copeland would be extended to curve across the River and connect to Petaluma Boulevard North to offer additional connections across the River within the downtown area.

Transit improvements would include the location of Sonoma Marin Area Rail Transit (SMART) stations at the existing historic depot and Corona Road. Key bus transit transfer stations (Petaluma Transit, Golden Gate Transit, and Sonoma County Transit) would be located at the Highway 101/Rainier Avenue and Highway 101/Lakeville Highway interchanges.

ALTERNATIVE 3: RIVER CORRIDOR DEVELOPMENT FOCUS

This alternative would focus on providing new housing opportunities connected to the Petaluma River corridor. In the design of new housing under this alternative, ample setbacks, in accordance with the Petaluma River Access and Enhancement Plan, would ensure that the River corridor would serve as a recreational amenity, accommodate stormwater flows, and would preserve river habitat. This alternative would emphasize new Medium and High Density residential neighborhood clusters along the River north of West Payran Street and small Medium Density pockets along Petaluma Boulevard North. Regional Commercial uses would be reinforced in the northern section of the River corridor and Mixed uses would be located along Petaluma Boulevard North to provide neighborhood retail and services to the residents.

Where development occurs away from the riverfront, new uses would be designed to be compatible with existing uses. Developable parcels adjoining business parks would also be developed as business parks or with supporting activities. Mixed Use and Thoroughfare Commercial would line arterial streets, and in Downtown, underutilized sites would contain retail, restaurant, entertainment, and/or residential uses. Regional and Neighborhood Commercial would be concentrated at Highway 101 interchanges and a portion of the existing Fairgrounds site would be transitioned to Regional Commercial.

Low density and Hillside sites along Petaluma Boulevard North would remain, except where opportunities for small clusters of high density development are available where topography is suitable.

Transportation improvements under this alternative would emphasize cross-town connections. Rainier Avenue would be extended to Petaluma Boulevard North with a highway underpass and an at-grade railroad crossing. The existing Corona Road overpass would be widened and expanded into a full highway interchange. Caulfield Lane would also be extended to Petaluma Boulevard South, with a new bridge over the River, and the northwest end of Copeland would be extended to curve across the River and connect to Petaluma Boulevard North.

Transit improvements would include SMART stations at the historic depot, Corona Road, and North McDowell Boulevard. Key transit transfer stations would be located at the Highway 101/Lakeville Highway interchange and the new Highway 101/Corona Road interchange with possible park-and-ride for carpools or vanpools at the Lakeville Highway/Frates Road intersection.

Table ES-4 summarizes the buildout estimates of each alternative compared with the proposed Plan.

Table ES-4 : Buildout Comparison – Proposed Plan and Alternatives

	Preferred Plan	*Alternative 1 (No Project)*	*Alternative 2*	*Alternative 3*
Residential				
Housing Units	27,949	26,560	28,761	29,580
Population	72,707	69,094	75,714	77,870
Non-Residential				
Floor Area	22,983,000	26,067,328	25,593,646	24,848,063
Total Jobs	46,540	46,601	48,100	47,600
Jobs/Housing Balance				
Employed Residents	44,450	42,244	44,300	47,400
Jobs/Employed Residents Ratio	1.05	1.10	1.09	1.01

1. No UGB expansion is proposed.
2. Buildout of the No Project alternative would result in a higher non-residential square footage than the proposed General Plan and the other alternatives because it assumes a larger amount of industrial development, which has a lower number of employees per square foot than office and commercial uses.

E.3 AREAS OF CONTROVERSY

There are several potential areas of controversy related to the impacts of the General Plan. Areas of controversy include:

Mobility—Controversies associated with transportation issues include limited cross-town connections and increased congestion. Despite the roadway improvements that would be implemented under the proposed General Plan, the population increase would still result in significant impacts and an LOS of E or worse at seven intersections. Due to General Plan policies that aim to create a pedestrian-friendly environment in Central Petaluma, the proposed General Plan will not include roadway improvements at some of the intersections that will be at an LOS E or worse under General Plan buildout. However, the General Plan will focus on improving the overall transportation environment in Petaluma by increasing cross-town connections as well as focusing multi-modal options to reduce reliance on the automobile and thereby reduce congestion.

Water Supply—The proposed General Plan would increase the demand for water to a level that would result in a water supply shortfall. Petaluma's total demand by 2025 is projected to be approximately 5,139 million gallons annually (15,771 acre-feet). Petaluma's current (2006) entitlement of 4,366 million gallons (13,400 acre-feet) per year from SCWA alone will not be sufficient to meet the growth projected through 2025. The water supply analysis also shows that by 2025, the average day maximum month (ADMM) demand, or peak demand, will be 22.1 mgd, which exceeds the new Impairment Memorandum Of Understanding limit of 17.1 mgd. By 2025, there will be an annual demand shortfall of 773 million gallons (2,371 acrefeet) per year and an ADMM demand shortfall of 5 mgd. The analysis further indicates that the shortfall

in ADMM may begin occurring during peak demand periods as early as 2007 and the annual demand shortfall may begin occurring as early as 2010.

The Water Supply and Demand section of the General Plan presents a plan to increase the use of recycled water, expand the water conservation program, and include the moderate use of groundwater to meet increasing potable water demands, until such time as the SCWA is able to expand its water transmission system.

Flooding—Flooding has taken place in the city, to the extent that at least some street flooding occurs, on average once per year over the past twenty or so years. Recent significant flooding events (meaning street and property flooding) have occurred in Petaluma in 1982, 1983, 1986, 1995, 1996, 1998, and 2005. The largest flood of record in the City of Petaluma occurred from January 3 through 5, 1982. A significant flood event occurred on December 30-31, 2005, over-taxing both piped and open channel systems. Under this General Plan, the City will continue its efforts to provide surface drainage and flood protection.

E.4 SUMMARY OF IMPACTS & ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Table ES-5 presents a summary of the proposed General Plan impacts identified in the EIR and the proposed General Plan policies that reduce these impacts. Because many of the Plan's policies are designed to avoid or minimize impacts, the Plan is self-mitigating with respect to most of the impacts identified in the EIR. However, in the issue areas of transportation, air, and noise significant unavoidable impacts are identified that cannot be mitigated to a less than significant level. Significant impacts are identified under the issue area of hydrology, but proposed General Plan policies and additional mitigation measures reduce these impacts to less than significant levels. Detailed discussions of the impacts and proposed policies that would reduce impacts are in Chapter 3. The significance of each impact with implementation of proposed General Plan policies is also shown in Table ES-5. The level of significance is determined by comparing the impact to the significance described in Chapter 3.

Based on the comparative analysis in Chapter 5 of this Draft EIR, the proposed General Plan is the environmentally superior alternative. This determination is based on the fact that the proposed General Plan, compared to the other alternatives, would result in less environmental impacts as a result of a moderate level of new development and population growth. The No Project Alternative would result in slightly fewer impacts in issue areas such as air quality, public services and public utilities, but the No Project Alternative would not reduce any significant impacts identified in Chapter 3 to less than significant levels.

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

Impact		*Proposed General Plan Policies that Reduce the Impact*		*Significance*
3.1-1	The proposed General Plan may result in the conversion of some farmland to non-agricultural uses.	2-P-1	Promote a range of land uses at densities and intensities to serve the community needs within the Urban Growth Boundary (UGB). A. Update the city's Development Code for consistency with the General Plan, including: Establishment of new base districts, consistent with the land use classifications in the General Plan. Continue the identification of overlay districts, such as the Floodplain and Historic Districts. Creation of the Petaluma River Corridor. Maintain both minimum and maximum development intensities as stipulated in the General Plan Land Use Classifications. Opportunities for infill without land division. Design Guidelines, where applicable.	Less than Significant
		2-P-2	Use land efficiently by promoting infill development, at equal or higher density and intensity than surrounding uses.	
		2-P-16	Maintain a permanent open space around the city by the continuation of the Urban Separator and the use of an Urban Separator Pathway, where appropriate.	
		2-P-23	Support designation of land uses in the unincorporated area beyond the Urban Growth Boundary as rural, agricultural and/or open space. A. Work with local, state and federal funding sources to acquire open space outside of the Urban Separator and/or beyond the Urban Growth Boundary where community-wide benefit is achieved.	
		2-P-25	It is the policy of the City to build within the agreed upon Urban Growth Boundary. No urban development shall be permitted beyond the Urban Growth Boundary. "Urban development" shall mean development requiring one or more basic municipal services including, but no limited to, water service, sewer, improved storm drainage	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			facilities, fire hydrants and other physical public facilities and services, but shall not mean providing municipal or public services to open space uses, public or quasi-public uses such as schools or public safety facilities. Said municipal or public services or facilities can be developed beyond the UGB to provide services within the UGB. A. Maintain a time certain and parcel-specific Urban Growth Boundary around the city, beyond which urban development will not take place. B. Use the growth management system, design review, or other project review methods to assure that the density of new residential development is greatest within and adjoining existing urbanized areas and gradually and logically lessens as it approaches the urban edge. C. Encourage the County to continue to promote agricultural land use and to strictly limit further residential infilling on lands beyond the Urban Growth Boundary within the Petaluma Planning Referral Area.	
3.2-1	Increased motor vehicle traffic would result in unacceptable level of service (LOS) at study intersections.	5-P-1	Develop an interconnected mobility system that allows travel on multiple routes by multiple modes. Develop a network that categorizes streets according to function and type, considering the surrounding land use context. D. Develop a network for off-street paths and routes according to function and type, considering the intensity of use and purpose. E. Review and update the City's Street Design Standards to be consistent with street function and typology, using Figure 5-2 as a guide. Explore the redesign of designated main and mixed use streets to potentially re-duce the width and/or number of travel lanes, improve the multimodal function of intersections, and introduce amenities such as wider sidewalks, special paving treatments, bus priority treatments, landscaped medians, and street trees within parking lanes.	Significant and Unavoidable

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	F. Evaluate the feasibility of road diets on streets with projected excess capacity at buildout.
5-P-2	Ensure the identified mobility system is provided in a timely manner to meet the needs of the community.
	Ensure new developments pay a fair share of mobility improvements and that those improvements are undertaken in context with that development.
	G. Review City transportation impact fees to insure that necessary citywide improvements are funded.
	H. Allocation of mitigation funds shall be designated to the specific capital improvement project for which it was exacted.
5-P-3	Ensure public improvements are constructed and maintained in a manner that is economically feasible to the budgetary constraints of the City.
	A. Establish priorities for transportation improvements and prepare an action program to implement identified street improvements.
	B. Investigate innovative means to fund the design, construction, and maintenance of both neighborhood and community-wide mobility infrastructure.
5-P-4	New development and/or major expansion of change of use may require construction of off-site mobility improvements to complete appropriate links in the network necessary for connecting new with existing neighborhoods and land uses.
5-P-5	Consider impacts on overall mobility and travel by multiple travel modes when evaluating transportation impacts.
5-P-8	The priority of mobility is focused on the movement of people within the community including the preservation of quality of life and community character.
	A. Develop formal transportation impact analysis guidelines that consider multi-modal impacts of new developments.
	B. Develop and adopt multi-modal level of service (LOS) standards

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	that examine all modes and vary the standards by facility type to imply a preference to selected modes based upon the context (including street type and location). C. LOS analysis data shall utilize the peak period rather than the peak hour for determining intersection LOS.
5-P-10	Maintain a level of service (LOS) standard for motor vehicle circulation that ensures efficient traffic flow and supports multi-modal mobility goals. LOS should be maintained at Level D or better for motor vehicles due to traffic from any development project.
5-P-11	Require proposed development to assist, in addition to seeking other funding sources, in the funding and construction of the following improvements: Washington Street/Highway 101 interchange improvements Rainier Avenue extension and interchange Caulfield Lane extension to Petaluma Boulevard South (southern crossing) Old Redwood Highway interchange widening Copeland Street extension to Petaluma Boulevard North Caulfield Lane/Payran Street Intersection Improvements Petaluma Boulevard/Magnolia Avenue Payran Street Intersection.
5-P-13	Encourage existing major employers to develop and implement Transportation Demand Management programs to reduce peak-period trip generation. A. Study the feasibility of a citywide TDM program that would be funded by annual fees or assessments on new development. B. Assign a proportion of TDM fees to Petaluma Transit for expansion of service and future fare reductions or fare elimination. C. As part of the development code, require TDM measures for all

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			new non-residential development. D. Assign trip reduction credits and reduced transportation impact fees for demonstrated commitment to TDM strategies. E. Reduce parking requirements for mixed-use developments and for developments providing shared parking or a TDM program. F. Establish a TDM program for City of Petaluma employees. G. Collaborate with Santa Rosa Junior College to minimize the impact of future enrollment growth on local traffic and parking demand, such as through TDM measures, limitations on parking near the College and on-campus parking management.	
3.2-2	Implementation of the proposed General Plan could cause increased demand for transit service.	5-P-40	Expand the bus transit system so that it is convenient and provides frequent, regular service along major City corridors serving shopping and employment destinations. A. Identify increased funding sources for local transit service and improvements.	Less than Significant
		5-P-41	Support efforts for transit oriented development around the Petaluma Depot and along the Washington Street and Petaluma Boulevard transit corridors. Reserve and plan for future bus stop enhancement and transit priority along Washington Street and Petaluma Boulevard.	
		5-P-42	Maintain a transit system of nominal cost to riders. A. Investigate the creation of subsidies for designations such as education, significant employment, and/or recreation destinations. B. Collaborate with Santa Rosa Junior College to promote measures to enhance transit access and service at the Petaluma Campus.	
		5-P-43	Coordinate transit improvement efforts between Petaluma Transit, Sonoma County Transit, Golden Gate Transit, and SMART.	
		5-P-44	Consider benefits to the possible consolidation of transit serving agencies.	
3.2-3	Provision of secure and	5-P-31	Make bicycling and walking more desirable by providing or requiring	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	safe bicycle parking may be inadequate.		development to provide necessary support facilities throughout the city. A. Provide secure, protected parking facilities and support services for bicycles at locations with high bicycle-parking demands such as multi-family housing and shopping and employment centers.	
3.2-4	Implementation of the proposed General Plan could result in increased demand for motor vehicle parking.	5-P-14	To the extent deemed feasible and appropriate by the City, maximize shared parking opportunities and support the construction of additional structured parking in Central Petaluma.	Less than Significant
3.3-1	Future development may result in a decrease of parkland per 1,000 residents.	6-P-1	Develop additional parkland in the city, particularly in areas lacking these facilities and where new growth is proposed, to meet the standards of required park acreage. A. Develop and implement a Parks Master Plan. B. Work with local, regional, and state agencies to acquire and fund further park-land acquisition and improvements. C. Undertake a proactive program to acquire necessary land and develop new parks in the locations shown in Figure 6-1, prioritizing areas where new development may occur and park opportunities may be lost, and in underserved neighborhoods. D. As part of the City's Development regulations establish common open space requirements for multi-family development. Such open space shall NOT to be counted toward public park dedication/in lieu fee requirements. E. Require land development along designated trails and pathway corridors to provide sufficient right-of-way and to ensure that adjacent new development does not detract from the scenic and aesthetic qualities of the corridor. F. Encourage and support the use of public land for community gardens.	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

6-P-2	Provide a comprehensive and integrated network of parks and open space and improve access to existing facilities where feasible. A. Provide public access and recreational opportunities along the length of the Petaluma River and its tributaries, to every extent possible.
6-P-3	Proposed parks, and proposed expansion of existing parks, as designated on the General Plan Land Use Map, are parcel specific, and shall be dedicated as a condition of development entitlements.
6-P-5	Maintain a park standard of 5 acres per 1,000 residents, in order to enhance the physical environment of the city and to meet the recreation needs of the community A. Revise the City's park in lieu fees/dedication requirements to match the General Plan standard of 5 acres per 1,000 residents.
6-P-6	Neighborhood parks are donated, constructed, and maintained within the developing property(ies). In addition to the donation and improvements, park impact fees shall be paid to offset costs associated with developing, upgrading, and maintaining community parks. Transfer of density from the donated park acreage may be considered where deemed appropriated by the City Council. A. Revise the City's Municipal Code to require dedication of neighborhood park land, and construction of associated neighborhood park improvements, in addition to the payment of park impact fees, eliminating the reimbursement component for neighborhood parks. B. Establish a transfer of development rights (TDR) program that allows project proponents on whose sites new parkland locations are designated, to transfer development rights from portions of the site dedicated as public open space/park beyond required dedication/in lieu requirements (5 acres per 1,000 residents) to the remainder of the site at a ratio of 1.5 x base land use designation on the site, subject to approval by the City Council and provided the following criteria are met:

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	The resulting park area meets the minimum size and location requirements shown in Table 6.1-8 and Figure 6-1; The park/open space is useful for recreational use, and not just leftover acreage; The park/open space is physically and perceptually available to the community-at-large, and not internal to the development; The resulting transfer will not unduly impact the character of the neighborhood where the development is located; and C. The park/open space is not at the city's edge, adjacent to an urban separator.
6-P-9	Continue to coordinate joint use of school properties as neighborhood parks and recreation program sites with school districts, which will help meet the community's demand for additional recreational facilities while realizing the cost benefits from the shared use of publicly-owned land.
6-P-12	Maintain the existing Petaluma Swim Center and Skate Park until new, comparable sites are identified, acquired and construction funding secured for these uses.
6-P-13	Work with the Sonoma County Regional Parks Department to encourage the development of Tolay Lake and Lafferty Ranch as an open space and passive use assets for the residents of Petaluma and southern Sonoma County.
6-P-14	Work with the Sonoma County Regional Park Department, the Sonoma County Open Space Authority, the Sonoma County Agricultural Preservation and Open Space District, the Sonoma County Water Agency, the Sonoma Land Trust, the Sonoma County Watershed Council, the California State Parks Department, and the California State Coastal Conservancy to develop common goals for open space beyond the Urban Growth Boundary, and coordinate acquisition efforts and priorities.
6-P-15	Should expansion beyond the 1998 Urban Growth Boundary occur,

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			priority shall be given to identification and development of adequate park lands to meet identified standards and community needs.	
		6-P-16	The City shall work with citizens, businesses, schools, organizations, and public agencies to fund an acceptable level of maintenance for all city-owned park and recreational facilities. A. Create opportunities and incentives, such as public acknowledgements plaques and signs, for other agencies, non-profits, private businesses, and user groups to participate in the provision, development and maintenance of parks, open space, and recreation facilities. B. Establish a program to work with adjacent neighborhoods to take responsibility for their neighborhood parks and urban separators, including the possibility of assuming maintenance needs or costs. Neighborhood parks 'adopted' by the residents shall remain publicly owned and accessible by the community.	
		6-P-17	Development that occurs adjacent to designated trails and pathway corridors shall be required to install and maintain the publicly owned and accessible trail, in perpetuity.	
3.4-1	New development may generate additional elementary and secondary school enrollment within all the school districts serving Petaluma.	7-P-12	Work with school districts to ensure availability of appropriate sites for all schools needs and to identify alternative short or long term uses for school facilities and sites that may not be needed because of decreased enrollment. A. Work with the Petaluma school districts to undertake a comprehensive, long-range (10 – 20 years) assessment of enrollment, school sites, and capacities.	Less than Significant
3.4-2	New development under the proposed General Plan requires police and fire protection that exceeds current staffing and facilities.	7-P-17	Achieve and maintain a minimum ratio of one fire suppression personnel per 1,000 population served. A. Fund additional staff to insure minimum ratio is maintained as population increases occur.	Less than Significant
		7-P-18	Ensure facilities, equipment and personnel are adequate to maintain	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	quality of service demands of the community, including but not limited to: fire suppression, Advanced Life Support (ALS), rescue, fire prevention, education, CUPA, and disaster prepared-ness and management. A. Expand Fire staffing to provide a Training Officer and Emergency Medical Services (EMS) Manager to insure maintaining compliance to Federal and State safety mandates. B. Continue education and training programs to maintain technical proficiency. C. Maintain and modernize emergency response facilities, including fire stations, as needed to accommodate population growth. D. Expand, as needed, staffing in the Fire Prevention Bureau to keep pace with in-creasing development and fire safety inspection impacts. E. Maintain safety department responsiveness to changes in community demo-graphics (i.e. age, ethnicity). F. Retain a current computed-based records management system to allow monitoring and evaluation of program performance.
7-P-19	Maintain a four minute travel time for a total of 6-minute response time for emergencies within the City. A. Require that properties outside of the four-minute (travel) response radii utilize fire-resistant materials and maintain fire breaks surrounding residences. B. Ensure that transportation improvements are provided for additional development so as not to adversely impact emergency response times.
7-P-21	Maintain and expand the Ambulance Enterprise System to meet continued needs in the District. A. Provide a third ALS ambulance within the Petaluma Fire Department. B. Establish and implement an ambulance replacement program.

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	C. Maintain current EMS training to meet industry standards.
7-P-25	Reduce the potential for a catastrophic fire event in the historic Downtown area.
	A. Complete the fire sprinkler retrofit installation within the historic Downtown business area.
	B. Maintain and update the business fire safety inspections and pre-incident planning documents (Pre-Plans).
7-P-31	Maintain a minimum standard of 1.4 police officers per 1,000 population.
	A. Consider funding additional staff to ensure the minimum ratio is maintained as the population increases.
7-P-32	Develop and use the City's Computer Aided Dispatch System (CAD) and Records Management System (RMS) for analysis of issues, crime trends and response times.
7-P-33	Pursue a long-term strategy for funding education and crime prevention programs recognizing that the costs of education and prevention are more effective in reducing crime than the costs of apprehending, prosecuting and incarcerating criminals.
7-P-34	Plan for expanding or replacing the police station with a facility of sufficient size to accommodate police operations, community requirements and the anticipated population growth.
7-P-35	Incorporate into new development, to the extent deemed appropriate and feasible, the Development Code Urban Design Standards for crime prevention.
7-P-36	Ensure adequate police staff to provide rapid and timely response to all emergencies and maintain the capability to have minimum average response times. Actions that could be taken to ensure rapid and timely response to all emergencies include:
	A. Analyze and monitor factors affecting response time (population growth, police staffing, and community policing programs) and average response times as guide-lines based on past experience.

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			B. Maintain, train, and equip special response teams for extraordinary or extremely hazardous emergency incidents.	
3.4-3	New development under the proposed General Plan requires emergency preparedness that may exceed the capabilities of the existing programs.	7-P-22	Ensure emergency response equipment and personnel training are adequate to follow the procedures contained within the Emergency Operations Plan for a major event, through maintaining and updating, as appropriate, the City's emergency preparedness programs, plans, and procedures to ensure the health and safety of the community in the event of an earthquake or other disaster. A. Review and update City department Disaster Operation Guides (DOGs) as needed. B. Provide training to all City personnel to remain current with all State and Federal mandated training for disaster preparedness (i.e. NIMS). C. Conduct training exercises for city personnel to simulate man-made or natural disasters. D. Consider the need, and fiscal feasibility, of providing a dedicated Disaster Coordinator. E. The Fire Department should provide the training and organization for community based volunteers who can provide localized assistance within their neighborhoods during an emergency.	Less than Significant
		7-P-23	Continue to utilize the Emergency Operations Center (EOC) to provide early warning of and response to all life-threatening hazards, such as earthquakes, floods, landslides, severe storms, and hazardous materials incidents. A. Evaluate the effectiveness of the EOC facility and consider relocation to other city facilities to improve emergency operations and coordination.	
		7-P-24	Ensure that critical facilities, including medical centers, school facilities, and other structures that are important to protecting health and safety in the community, remain operative during emergencies.	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			B. Work with local hospitals and school districts to coordinate planning, communication and response.	
		7-P-28	Expand the capability of the Fire Department to respond to River related emergencies.	
			A. With revitalization of the Downtown and the Petaluma River corridor, along with increased river activities, purchase a new rescue/fire boat and relocate it on the River for better response times and increased opportunities for emergency response.	
3.4-4	Development near the Urban Growth Boundary may increase risk from wild land fires due to the proximity of development to open areas of grassland or chaparral.	7-P-19	Maintain a four minute travel time for a total of 6-minute response time for emergencies within the City.	Less than Significant
			A. Require that properties outside of the four-minute (travel) response radii utilize fire-resistant materials and maintain fire breaks surrounding residences.	
			B. Ensure that transportation improvements are provided for additional development so as not to adversely impact emergency response times.	
3.5-1	New development that would result from the proposed General Plan may increase water demand that may exceed available supply.	8-P-1	Optimize the use of imported water from the SCWA to provide adequate water for present and future uses.	Less than Significant
			A. Prepare, implement, and maintain long-term, comprehensive water supply plans and options in cooperation with the appropriate state and federal agencies, regional authorities, water utilities, and local governments.	
			B. Support regional efforts towards ensuring that imported water is reliable, cost-effective, and is of high quality.	
		8-P-2	Work toward development and execution of new water supply agreements with SCWA to ensure adequate potable water.	
		8-P-3	Work with Sonoma County Water Agency on the South Transmission System Project to develop the parallel aqueduct along the City's preferred eastside alignment in order to improve reliability of water supplies.	
		8-P-4	The City shall routinely assess its ability to meet demand for potable	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	water. A. The City shall continue to monitor the demand for water for projected growth against actual use, and ensure that adequate water supply is in place prior to, or in conjunction with, project entitlements. B. The City planning staff will discuss water supply with the developer for each new development early in the planning process and inform Water Resources staff of upcoming demands as provided by the applicant. C. The Community Development Department shall maintain a tiered development record to monitor pending and projected developments to allow a reasonable forecast, by the Water Resources Department, of projected water demand. D. The City shall upgrade utility billing software as necessary to provide the ability to efficiently track and project water demand trends including, but not limited to, the following parameters: Land use categories Customer classifications
8-P-5	Develop alternative sources of water to supplement imported supply. A. Expand the use of recycled water to offset potable demand. B. Expand water conservation to further improve the efficient use of potable water. C. Continue to use groundwater to meet emergency needs.
8-P-6	The City shall utilize the Water Demand and Supply Analysis Report, June 2006 and any amendments thereto, for monitoring, assessing, and improving the City's municipal water supply.
8-P-7	Limit the provision of potable water service to lands within the Urban Growth Boundary with the exception of the provisions outlined in the Urban Growth Boundary measure and incorporated into Chapter 2 Land Use, Growth Management, and the Built Environment.

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

3.5-2	New development may result in the need to expand new wastewater treatment facilities, the construction of which may cause significant environmental effects.	8-P-9	Provide tertiary recycled water for irrigation of parks, playfields, schools, golf courses and other landscape areas to reduce potable water demand. A. The City will expand the Ellis Creek Water Recycling Facility to provide tertiary and secondary recycled water as outlined in the Recycled Water Master Plan. B. Operate and maintain the Ellis Creek Water Recycling Facility to produce recycled water to regulatory standards.	Less than Significant
		8-P-10	The City may require the use of recycled water through the City entitlement process. A. New development may be required to install a separate recycled water system as deemed necessary and appropriate by the City to offset potable demand. B. The City will evaluate where the most appropriate potable water offset improvements can be implemented through the City's entitlement process. C. The City shall determine the appropriate means of potable offset, individual project systems may be required in addition to City-required improvements and/or fees relating to the recycled water offset system.	
		8-P-11	The City may continue to work with agricultural users to reuse secondary recycled water. In addition, the City may purchase land as a backup reuse site, if deemed necessary and appropriate to meet system needs.	
		8-P-12	The City will provide water of adequate quality and quantity to meet customer needs. The City, at its sole discretion, will determine whether a given customer's supply will be potable water, tertiary recycled water, secondary recycled water, groundwater, or a combination of these.	
		8-P-13	The City will work to convert existing potable water customers identified under the City's Recycled Water Master Plan to tertiary recycled water as infrastructure and water supply becomes available.	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

		8-P-14	The water recycling facility shall be operated and maintained in compliance with all State and Federal permit requirements.	
		8-P-15	Capacity of the water recycling facility shall be maintained, and expanded as necessary, to keep pace with the city's growth.	
		8-P-16	Comply with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of the City's sanitary sewer collection system A. Perform condition assessment of existing facilities. B. Survey facilities and maintain current system maps. C. Perform regular cleaning and inspection to help eliminate sanitary sewer overflows. D. Fund collection system infrastructure replacement on a 100-year life cycle. E. Regularly update the sanitary sewer flow model and make improvements necessary to support development.	
		8-P-17	Maintain and expand public access and educational opportunities at the Ellis Creek Water Recycling Facility.	
3.5-3	The proposed General Plan could result in wasteful, inefficient, or unnecessary consumption of energy by residential, commercial, industrial, or public uses.	4-P-14	Develop and adopt local energy standards that would result in less energy consumption than standards set by the California Energy Commission's (CEC) Title 24. The State of California addresses energy conservation through Title 24 "Energy Efficiency Standards for Residential and Nonresidential Buildings." Whereas Title 24 applies to new buildings, much of the City west of Highway 101 was developed prior to 1953 and there is a tremendous opportunity to encourage greater energy efficiency in Petaluma's older structures. Energy-efficient air conditioners, high-efficiency lighting, photocell dimming, higher insulation levels, and reflective rooftops are examples of standards that could reduce energy consumption in new and existing buildings. A. Identify and implement energy conservation measures that are appropriate for public buildings.	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	B. Identify energy conservation measures appropriate for retrofitting existing structures. Work with local energy utility to encourage incentive programs for retrofitting. Consider the use of alternative transportation fuels among City-owned vehicles and the Petaluma Transit system to reduce dependence on petroleum-based fuels and improve local air quality. In 2002, the City of Petaluma adopted a Clean City Fleets resolution. The Clean Fleets Program, sponsored by the American Lung Association, directs local government staff to purchase the cleanest vehicle for municipal fleets
4-P-15	Encourage use and development of renewable or nontraditional sources of energy. A. Participate in state and local efforts to develop appropriate policies and review procedures for the institution of renewable energy sources such as solar, wind, geothermal, and hydroelectric power. One such effort began in August 2005, when the City adopted a resolution requiring developers of residential projects of 5 or more units to wire all units for future photo voltaic arrays. In addition, the State's Emerging Renewables Buydown Program provides rebates to consumers who install qualifying energy systems, such as photo voltaic wind turbines, and fuel cells. As of July 2005, nearly 80 participants from within Petaluma have been involved with the program through the use of solar energy systems. B. Adopt green building code to allow use of alternative building materials and methods, under a discretionary review process. C. Work with the Petaluma Area Chamber of Commerce and PG&E in encouraging local businesses to undertake energy audits and implement energy reduction improvements. D. Consider the feasibility of requiring a percentage of new development to meet 50% of their energy needs from fossil fuel alternatives (e.g., solar panels, etc.).

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

3.5-4	The proposed General Plan could require the need for additional energy facilities, the construction of which could have significant environmental impacts.	NA		Less than Significant
3.5-5	The proposed General Plan could cause a substantial increase in transportation energy consumption due to the projected increases in trips associated with future population and employment growth.	5-P-13	Encourage existing major employers to develop and implement Transportation Demand Management programs to reduce peak-period trip generation. A. Study the feasibility of a citywide TDM program that would be funded by annual fees or assessments on new development. B. Assign a proportion of TDM fees to Petaluma Transit for expansion of service and future fare reductions or fare elimination. C. As part of the development code, require TDM measures for all new non-residential development. D. Assign trip reduction credits and reduced transportation impact fees for demonstrated commitment to TDM strategies. E. Reduce parking requirements for mixed-use developments and for developments providing shared parking or a TDM program. F. Establish a TDM program for City of Petaluma employees. G. Collaborate with Santa Rosa Junior College to minimize the impact of future enrollment growth on local traffic and parking demand, such as through TDM measures, limitations on parking near the College and on-campus parking management.	Less than Significant
3.5-6	New development may result in increased demand for solid waste disposal at the County landfill.	4-P-16	Continue to work toward reducing solid waste and increasing recycling, in compliance with the Countywide Integrated Waste Management Plan (ColWMP).	Less than Significant
		4-P-17	Work with Sonoma County to identify environmental and economical means to meet the need for solid waste disposal.	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

		4-P-18	Require new or remodeled multifamily residential and all non-residential development to incorporate attractive and convenient interior and exterior storage areas for recyclables.	
		4-P-19	Continue to encourage waste reduction and recycling at home and in businesses through public education programs, such as information handouts on recycling, yard waste, wood waste, and hazardous waste.	
		4-P-20	Consider development of a residential and commercial food waste composting program.	
		4-P-21	Purchase goods containing recycled materials for City use, to the extent possible.	
3.6-1	Buildout of the General Plan 2025 may degrade water quality.	8-P-37	Due to potential positive impact to increased water discharge, all development activities shall be constructed and maintained in accordance with Phase 2 National Pollutant Discharge Elimination System (NPDES) permit requirements. A. The Water Resources and Conservation Department shall review, and have the authority to conditionally approve; all development permits to insure compliance with NPDES Phase 2 requirements (adopted 2003 or thereafter amended). B. Maintain, update as needed, and implement the City's Storm Water Management Plan to retain a current storm water discharge permit with the California Regional Water Quality Control Board.	Less than Significant
3.6-2	Buildout of the General Plan 2025 may increase depletion of groundwater supply or substantially interfere with groundwater recharge.	8-P-20	Manage groundwater as a valuable and limited shared resource by protecting potential groundwater recharge areas and stream sides from urban encroachment within the Petaluma watershed. A. The City will use discretionary permits to control construction of impervious surfaces in groundwater recharge areas. Potential recharge area protection measures at sites in groundwater recharge areas include, but are not limited to: Restrict coverage by impervious materials; Limit building or parking footprints; Require construction of percolation ponds on site;	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			Require surface drainage swales. B. Urge the County when receiving development applications to examine the combined impacts of new septic tanks placed in proximity to wells. The County should examine the cumulative impacts of the allowed development densities in the West Petaluma Specific Plan area and compare the results to established water quality standards. Test wells should be required prior to issuing any building permits.	
3.6-3	Buildout of the proposed General Plan may increase drainage flows as a result of impervious surfaces, thereby altering the existing drainage patterns.	8-P-28	The area upstream of the Corps weir, and below the confluence to Willowbrook Creek with the Petaluma River, located within the 1989 FEMA floodplain (and any amendments thereto) and adjacent to the Petaluma River, shall include a Petaluma River Corridor (PRC) set aside for the design and construction of a flood terrace system to allow the River to accommodate a 100-year storm event within a modified River channel. A. The Water Resources and Conservation Department shall work with the Community Development Department, through the project entitlement process, to insure the PRC is implemented at the cost of the development. B. Maintenance, in perpetuity, of the PRC and applicable flood terrace, storm water flow capacity, environmental habitat and public access improvements shall be maintained, through a funding mechanism approved by the City, as a condition of project entitlement.	Less than Significant
		8-P-29	Working with SWCA and the Sonoma County Board of Supervisors, the City shall identify the necessary setbacks for the Willowbrook, Marin, and Liberty Creek corridors within the Petaluma Planning Referral Area to include a Creek Corridor set aside for the design and construction of a flood terrace system to allow the Creeks to accommodate a 100 year storm event within a modified creek channel. A. The City Water Resources and Conservation Department shall work with the SWCA to implement the Petaluma River Watershed Master Drainage Plan (SWCA, June 2003 or future	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	update). B. The City Water Resources and Conservation Department shall work with the SWCA to study the feasibility, and subsequently implement, a regional serving detention/retention basin system to reduce localized flooding, provide seasonal agricultural water sources, and offer opportunities to enhance recharge of the Petaluma aquifers. C. The City shall, in accordance with the XP-SWMM analysis of the Petaluma River corridor, work with the regulatory and advisory agencies and property owners along the River to implement the identified physical improvements to accommodate the 100-year storm event within a modified River channel. D. The City shall, in accordance with the SWCA, undertake a study to assess and define the corridor section widths necessary to quantify the volume and dimension of a creek corridor system necessary to allow the W, M, and L creeks to accommodate the 100-year storm event. E. Setbacks beyond the creek to allow additional peak flows shall be considered on a reach by reach basis. Alternative land uses for seasonal use may be considered within this additional setback area.
8-P-30	Within a 200' setback from centerline of the River and creeks referenced in Policies 3-P-28 and 2-P-29, stated above [in the General Plan], no development shall be permitted on lands within that 400' wide corridor until such time as the study is concluded and approved by the SWCA and City of Petaluma. Thereafter all lands affected shall set aside the necessary river and/or creek corridor areas and, as development occurs, shall undertake the identified surface water containment enhancement improvements. A. The watershed model, XP-SWMM or updates thereto, shall be maintained, in cooperation between the City and SCWA, to assist in the evaluation of development proposals and in the design of regional watershed improvements to reduce flood elevations. B. Proposed development applications may be charged a model

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

update fee to cover costs associated with evaluating a specific proposal for project specific and cumulative impacts to the regional surface water system.

C. On-site and off-site improvements, deemed necessary by the City of Petaluma, to reduce the surface water impacts associated with a specific development proposal shall be designed, constructed, and maintained in perpetuity at the cost of the development associated with said impacts.

8-P-31 In accordance with the studies undertaken for the Corps Flood Protection Project, existing areas subject to periodic surface water inundation and containment, within the Corona and Denman Reaches (Lynch Creek confluence with the Petaluma River upstream to the Old Redwood Highway over-crossing of Willowbrook Creek), shall be preserved and enhanced where feasible to reduce localized flooding.

A. The Department of Water Resources and Conservation shall work with the SWCA and the Community Development Department to insure that reduction of the protection afforded by the Payran Corps Flood Protection Project is not compromised or reduced by proposed development.

8-P-32 Areas within the Petaluma watershed, outside of the City of Petaluma, which are subject to periodic surface water inundation and containment, should not be modified in any manner to reduce the historic storage characteristics and capacity.

A. The City shall work with the County of Sonoma to prohibit placement of fill materials within those areas identified as having historic storage capacity, which have a detrimental impact on downstream flows, including the increase in peak discharge volumes in the downstream areas.

Mitigation Measure

3.6(a) Use flood terracing in the Corona and Denman Reaches, maintain surface water drainage swales along Highway 101, install flap gates or valves to eliminate the backflow of surface waters from the east side of Highway 101 to the west side, which adversely impact residential areas, and increase berm heights that

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			presently protect residential areas such as Leisure Lake and along Corona Creek between Youngstown and Petaluma Estates Mobilehome Parks. Understanding the out-of-bank impacts associated with the lower intensity storms (10, 25, and 50) may allow incremental enhancements of the River corridor to increase capacity without adversely impacting peak flows, while enhancing riparian habitats and providing public access amenities.	
3.6-4	New development may overload storm drain system capacity or require expansion of existing or construction of new facilities.	8-P-33	Work with SWCA to insure maintenance of the engineered channels, natural creeks, and enclosed surface water system.	Less than Significant
		8-P-34	Work with regulatory and advisory agencies to facilitate preservation and environmental enhancement of the natural corridor for species of importance and native to the area.	
		8-P-35	Promote public education and stewardship of the riparian corridor.	
		8-P-36	Work with the U.S. Army Corps of Engineers to dredge the river channel downstream of the constriction weir to maintain the 100-year designed conveyance capacity and navigable channel.	
		Mitigation Measure		
		3.6(b)	The continuation of zero-net fill and when appropriate, zero-net runoff, within the Development Code will be utilized to assess site-specific impacts and identify mitigations associated with storm drain pipe capacities. In addition, creation of flood terrace improvements shall be used to enhance the riparian corridor for wildlife habitats and improve public access, education and stewardship of the River and creek corridors.	
3.6-5	Buildout of the proposed General Plan 2025 may expose people or structures to risk of existing flooding hazards, or may place structures which could impede or		Policies 8-P-28 through 8-P-32 (see Impact 3.6-3)	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	redirect flood flows.	Mitigation Measure 3.6(c) Include the following policy and programs in the proposed General Plan. Policy 8-P-X. No new inhabited structure or development shall be entitled within the 100-year General Plan buildout flood boundary until such time as data is available to provide a 100-year base flood elevation, utilizing the current hydrologic information from the City's XP-SWMM, for the specific site to determine minimum floor elevations. A. The City shall create and maintain a 2-D model of the Petaluma River within the City of Petaluma and work with SCWA to achieve a 2-D model for the Petaluma Watershed. B. Utilizing the 2-D model, the City of Petaluma will work with SCWA to identify, design, fund, and construct regional solutions to minimize the flooding impacts associated with historic and increasing out-of-bank flows which occur from increasing storm flow and velocity from out-of-City areas into the City. C. Working with Sonoma County, the City will continue to ensure that zero net fill policies are enforced within the unincorporated area for areas encumbered by the regulatory floodplain of the Petaluma River. D. Utilizing an approved modeling tool, the City shall diligently pursue the remapping of the regulatory Floodway and Floodplain, through the Corps of Engineers, following the completion of the Payran Reach Corps project. E. Working with Sonoma County, the City shall pursue State and Federal funding opportunities to acquire and demolish housing, which remain located within the regulatory Floodway, once remapping occurs.	
3.6-6	Buildout of the General Plan 2025 may require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction	Policy 8-P-29 (see Impact 3.6-3).	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	of which could cause significant environmental effects.			
3.7-1	Buildout of the proposed General Plan would expose people or structures to strong seismic groundshaking or seismic-related ground failure.	10-P-1	Require geotechnical studies prior to development approval in geologic and/or seismic hazard areas. Require or undertake comprehensive geologic and engineering studies for critical structures regardless of location. *Critical structures are those most needed following a disaster or those that would pose hazards of their own if damaged. They include utility centers and substations, water reservoirs, hospitals, fire stations, police and emergency communications facilities, and bridges and overpasses.*	Less than Significant
		10-P-4	Adopt and amend as needed updated versions of the California Building Code (CBC) so that optimal earthquake-protection standards are used in construction and renovation projects. *Earthquake-resistant design and materials must meet or exceed the current seismic engineering standards of the CBC Seismic Zone 4 requirements.*	
		10-P-5	Explore programs that would encourage, assist, or provide incentives to property owners to retrofit their buildings for seismic safety.	
3.7-2	Development under the proposed General Plan would be subject to risk from settlement and/or subsidence of land, lateral spreading, or expansive soils, creating substantial risks to life or property.	NA		Less than Significant
3.7-3	Buildout of the proposed General Plan would result in soil erosion.	10-P-2	On sites with slopes greater than 30 percent, require all development to be clustered outside of the 30 percent slope areas (and preferably on land less than 15 percent in slope) where possible.	Less than Significant
		10-P-3	Regulate the grading and development of hillside areas for new urban land uses, by instituting a Hillside Overlay or other similar mechanism in the Development Code. Ensure that new development on hillsides is	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			constructed to reduce erosion and land-slide hazards: Limit cut slopes to 3:1, except where an engineering geologist can establish that a steeper slope would perform satisfactorily over the long term. Encourage use of retaining walls or rock-filled crib walls as an alternative to high cut slopes. Ensure revegetation of cut-and-fill slopes to control erosion. Plant materials for revegetation should not be limited to hydro-seeding and mulching with annual grasses. Trees add structure to the soil and take up moisture while adding color and diversity. Ensure blending of cut-and-fill slopes within existing contours, and provision of horizontal variation, in order to mitigate the artificial appearance of engineered slopes. Ensure structural integrity of sites previously filled before approving redevelopment. See also [General Plan] Chapter 2: Land Use, Growth Management and the Built Environment and [General Plan] Chapter 3: Community Design Character and Sustainable Building for additional hillside policies and programs.	
3.8-1	Implementation of the proposed General Plan could result in substantial adverse effects on special status fish species or their habitat.	4-P-1	Protect and enhance the Petaluma River and its tributaries through a comprehensive river management strategy of the following programs: A. Implement the Petaluma River Access and Enhancement Plan including expanded improvements identified through project specific environmental assessment. B. Institute and maintain public access to and along the entire length (on one or both sides), of the river while ensuring that natural resources and river dependent industry are protected. C. Require design review to address the relationship and stewardship of that project to the river or creek for any development on sites with frontage along the river and creeks, identified on Figure 1-3	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	(of the General Plan). D. Create setbacks for tributaries extending a minimum of 50 feet outward from the top of each bank, with extended buffers where significant habitat areas, vernal pools, or wetlands exist. Development shall not occur within this setback, except as part of greenway enhancement (for example, trails and bikeways). Where there is degradation within the zone, restoration of the natural creek channels and riparian vegetation is mandatory. E. Facilitate compliance with Phase II standards of the National Pollutant Discharge Elimination System (NPDES) to improve the water quality and aesthetics of the river and creeks. F. Work with the State Lands Commission, State Department of Fish and Game, the Sonoma County Water Agency, and other jurisdictional agencies on preservation/enhancement of the Petaluma River as a component of reviewing major development along the River. G. Expand the planting and retention of trees along the upper banks of the river and creeks to reduce ambient water temperature and shade out invasive, non-native species.
4-P-3	Conserve wildlife ecosystems and sensitive habitat areas in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation. A. Utilize Technical Memorandum 3: Biological Resources Review as a baseline document, expanding to address project specific impacts.
4-P-4	Protect special status species and supporting habitats within Petaluma, including species that are State or Federal listed as endangered, threatened, or rare (shown in Table 4.1-1 of the General Plan). A. As part of the development review process, site-specific biological resource assessments are required to consider the impacts on riparian and aquatic resources and the habitats they provide for invertebrates, fish, amphibians, reptiles, birds, mammals, and plants. If development is located outside these ecologically sensitive

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			regions, no site-specific assessment of biological resources may be necessary. Appropriate mitigation measures to reduce impacts to sensitive habitats and special status species would be imposed on a project-by-project basis according to Petaluma's environmental review process. B. Review all development proposals along the navigable portion of the river to determine that they are designed to encourage long-term retention of river-dependent uses to the extent feasible.	
		4-P-5	Continue to support rural land use designations and Agricultural Best Management Practices within the Sonoma County General Plan. A. Coordinate with Sonoma County's Agricultural Preservation and Open Space District, Permit and Resource Management Department, and Water Agency to protect riparian corridors and critical biological habitats as well as to reduce cumulative impacts on sensitive watershed areas outside of the city limits. B. Work with County, State and federal agencies to ensure that development within the Planning Referral Area does not substantially affect State or federally listed rare, endangered, or threatened species or their habitats. Require assessments of biological resources prior to approval of any development in or within 300 feet of ecologically sensitive areas.	
3.8-2	Implementation of the proposed General Plan could result in substantial adverse effects on California Brackishwater Snail or its habitat.	NA		Less than Significant
3.8-3	Implementation of the proposed General Plan could result in substantial adverse effects on the salt marsh harvest mouse or its habitat.		Policies 4-P-3, 4-P-4, and 4-P-5 (see Impact 3.8-1).	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

3.8-4	Implementation of the proposed General Plan could result in substantial adverse effects on special status bat species or their habitat.		Policies 4-P-3, 4-P-4, and 4-P-5 (see Impact 3.8-1).	Less than Significant
3.8-5	Implementation of the proposed General Plan could result in substantial adverse effects on American badger or its habitat.		Policies 4-P-3, 4-P-4, and 4-P-5 (see Impact 3.8-1).	Less than Significant
3.8-6	Implementation of the proposed General Plan could result in substantial adverse effects on western pond turtle, California tiger salamander, foothill yellow-legged frog, California red-legged frog, or their habitat.		Policies 4-P-3, 4-P-4, and 4-P-5 (see Impact 3.8-1).	Less than Significant
3.8-7	Implementation of the proposed General Plan could result in substantial adverse effects on nesting raptor species or their habitat.		Policies 4-P-1, 4-P-3, 4-P-4, and 4-P-5 (see Impact 3.8-1).	Less than Significant
		4-P-6	Improve air quality through required planting of trees along streets and within park and urban separators, and retaining tree and plant resources along the river and creek corridors. A. Require planting of trees at a ratio of five (24" box or larger) for every significant tree removed at a project site. Replacement planting may occur on the project sire or on a publicly owned area,	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			with long-term maintenance assured.	
3.8-8	Implementation of the proposed General Plan could result in substantial adverse effects on California black rail bird, San Pablo song sparrow, Saltmarsh common yellow throat or other special status bird species.		Policies 4-P-1, 4-P-3, 4-P-4, 4-P-5, and 4-P-6 (see Impact 3.8-7).	Less than Significant
3.8-9	Implementation of the proposed General Plan could result in substantial adverse effects on oak woodland and special status plant species or their habitat.		Policies 4-P-1, 4-P-3, 4-P-4, 4-P-5, and 4-P-6 (see Impact 3.8-7).	Less than Significant
3.8-10	Implementation of the General Plan could adversely affect riparian areas, wetlands and/or "other waters of the United States."		Policies 4-P-1, 4-P-3, 4-P-4, and 4-P-5 (see Impact 3.8-1).	Less than Significant
3.8-11	Implementation of the proposed General Plan would not interfere with the movement of fish or wildlife species.	NA		Less than Significant
3.8-12	Implementation of the proposed General Plan may conflict with the provisions of the Draft Santa Rosa Plain	NA		Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	Conservation Strategy.			
3.9-1	At buildout, implementation of the proposed General Plan would generate increased local traffic volumes in the Planning Area that would result in a substantial increase to existing exterior noise levels that are currently above the City standards.	10-P-6	Continue efforts to incorporate noise considerations into land use planning decisions, and guide the location and design of transportation facilities to minimize the effects of noise on adjacent land uses.	Significant
		10-P-7	Discourage location of new noise-sensitive uses, primarily homes, in areas with projected noise levels greater than 65 dB CNEL. Where such uses are permitted, require incorporation of mitigation measures to ensure that interior noise levels do not exceed 45 dB CNEL.	
		10-P-9	Continue to require control of noise or mitigation measures for any noise-emitting construction equipment or activity. *The City's Noise Ordinance establishes controls on construction-related noise.*	
		10-P-10	As part of development review, use [General Plan] Figure 10-2: Land Use Compatibility Standards to determine acceptable uses and installation requirements in noise-impacted areas.	
		10-P-11	NWPRA corridor, without findings that such walls will not be detrimental to community character. When sound walls are deemed necessary integrate them into the streetscape, whenever possible.	
		10-P-12	In making a determination of impact under the California Environmental Quality Act (CEQA), consider an increase of four or more dBA to be "significant" if the resulting noise level would exceed that described as normally acceptable for the affected land use in General Plan Figure 10-3: Land Use Compatibility for Community Noise Environments.	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

3.9-2	Implementation of the proposed General Plan would add new stationary sources of noise, but would not exceed the City noise standards.		Policies 10-P-7 and 10-P-12 (see Impact 3.9-1).	Less than Significant
		10-P-8	Ensure that the City's Noise Ordinance and other regulations: Require that applicants for new noise-sensitive development in areas subject to noise levels greater than 65 dB CNEL obtain the services of a professional acoustical engineer to provide a technical analysis and design of mitigation measures. Require placement of fixed equipment, such as air conditioning units and condensers, inside or in the walls of new buildings or on roof-tops of central units in order to reduce noise impacts on any nearby sensitive receptors. Establish appropriate noise-emission standards to be used in connection with the purchase, use, and maintenance of City vehicles.	
3.9-3	Construction activities associated with implementation of the proposed General Plan would generate and expose persons nearby to excessive groundborne vibration or groundborne noise levels.		Policy 10-P-9 (see Impact 3.9-1).	Less than Significant
3.9-4	Construction activities associated with implementation of the proposed General Plan could generate noise levels		Policy 10-P-9 (see Impact 3.9-1).	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	that exceed the City standards.			
		Mitigation Measure 3.9(a) Project developers shall require by contract specifications that the following construction best management practices (BMPs) be implemented by contractors to reduce construction noise levels: Two weeks prior to the commencement of construction, notification must be provided to surrounding land uses disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period; Ensure that construction equipment is properly muffled according to industry standards; Place noise-generating construction equipment and locate construction staging areas away from residences, where feasible; Schedule high noise-producing activities between the hours of 8 a.m. and 5 p.m. to minimize disruption on sensitive uses; and Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, noise barriers or noise blankets.		
3.10-1	Buildout of the proposed General Plan would result in population levels that could conflict with the Bay Area 2005 Ozone Strategy.	4-P-8	Reduce motor vehicle related air pollution. A. Enforce land use and transportation strategies described in Chapter 2: Land Use and Chapter 5: Mobility that promote use of alternatives to the automobile for transportation, including walking, bicycling, bus transit, and carpooling.	Significant
		4-P-11	Improve air quality by reducing emissions from stationary point sources of air pollution (e.g. equipment at commercial and industrial facilities) and stationary area sources (e.g. wood-burning fireplaces & gas powered lawnmowers) which cumulatively emit large quantities of emissions. A. Work with the Bay Area Air Quality Management District to achieve emissions reductions for non attainment	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

pollutants; including carbon monoxide, ozone, and PM-10, by implementation of air pollution control measures as required by State and federal statutes.

B. The BAAQMD's CEQA Guidelines should be used as the foundation for the City's review of air quality impacts under CEQA.

C. Use Petaluma's development review process and the California Environmental Quality Act (CEQA) regulations to evaluate and mitigate the local and cumulative effects of new development on air quality.

D. Require development projects to abide by the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines.

E. These measures would reduce exhaust and particulate emissions from construction and grading activities.

F. Reduce emissions from residential and commercial uses by requiring the following:

Use of high efficiency heating and other appliances, such as cooking equipment, refrigerators, and furnaces, and low NOx water heaters in new and existing residential units. Require the Building Division to maintain standards for these;

Compliance with or exceed requirements of CCR Title 24 for new residential and commercial buildings;

Incorporation of passive solar building design and landscaping conducive to passive solar energy use for both residential and commercial uses, i.e., building orientation in a south to southeast direction, encourage planting of deciduous trees on west sides of structures, landscaping with drought resistant species, and use of groundcovers rather than pavement to reduce heat reflection;

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	Use of battery-powered, electric, or other similar equipment that does not impact local air quality for non-residential maintenance activities; Provide natural gas hookups to fireplaces or require residential use of EPA-certified wood stoves, pellet stoves, or fireplace inserts. *Current building code standards generally ban the installation of open-hearth, wood-burning fireplaces and wood stoves in new construction. It does, however, allow for the use of low-polluting wood stoves and inserts in fireplaces approved by the federal Environmental Protection Agency, as well as fireplaces fueled by natural gas.*
5-P-13	Encourage existing major employers to develop and implement Transportation Demand Management programs to reduce peak-period trip generation. A. Study the feasibility of a citywide TDM program that would be funded by annual fees or assessments on new development. B. Assign a proportion of TDM fees to Petaluma Transit for expansion of service and future fare reductions or fare elimination. C. As part of the development code, require TDM measures for all new non-residential development. D. Assign trip reduction credits and reduced transportation impact fees for demonstrated commitment to TDM strategies. E. Reduce parking requirements for mixed-use developments and for developments providing shared parking or a TDM program. F. Establish a TDM program for City of Petaluma employees. G. Collaborate with Santa Rosa Junior College to minimize

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			the impact of future enrollment growth on local traffic and parking demand, such as though TDM measures, limitations on parking near the College and on-campus parking management. H. Encourage provision of preferential parking in selected areas for designated carpools.	
3.10-2	Implementation of the proposed General Plan may contribute substantially to an existing air quality violation.		Policies 4-P-8 and 4-P-11 (see Impact 3.10-1).	Less than Significant
		4-P-12	To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall include in construction contracts the following requirements or measures shown to be equally effective: Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction; Minimize idling time of construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment; Use alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline); Use add-on control devices such as diesel oxidation catalysts or particulate filters; Use diesel equipment that meets the ARB's 2000 or newer certification standard for off-road heavy-duty diesel engines; Phase construction of the project; Limit the hours of operation of heavy duty	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			equipment.	
3.10-3	Implementation of the proposed General Plan may result in a cumulatively considerable net increase of criteria pollutants for which the region is in nonattainment under an applicable national or State ambient air quality standard.	NA		Less than Significant
3.10-4	CO emissions associated with buildout of the proposed project may result in exposure of sensitive receptors to CO emissions.		Policy 4-P-8 (see Impact 3.10-1).	Less than Significant
3.11-1	New development may block views of Sonoma Mountain and ridgelines and/or alter the visual character of the hillsides.	2-P-14	Allow development in hillside areas that preserve ridgelines and are site sensitive. A. Establish development and design standards related to residential development in hillside areas that address: Location of hillside residential units, including preserving ridgelines. Clustering provisions to preserve open space, natural assets (woodlands, creeks, etc.). Building development and design in a clustered format, including standards for building height and massing. Provisions for clustered development, including amount of bonus, alternate development forms, common recreational facilities, phasing, etc.	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	B. Enhance the hillside development regulations in the Development Code to include: Regulating development density by degree of hillside slope. Protecting unique natural features, including landforms, mature trees, and ridge lines, by requiring location of structures away from these assets. Encouraging architectural design that reflects the natural form of the hillside setting, in order to minimize visual and environmental impacts. Preventing the significant alteration of hillside topography through grading and paving. Use of visually unobtrusive building materials.
2-P-15	Retain ridgelines and prominent hillsides as open space through clustering and transfer of density to other parts of a development site (applies to Rural and Very Low Residential areas within the West Hills, South Hills and Petaluma Boulevard North subareas only).
3-P-63	Extend the Urban Separator. To the extent feasible, provide an area up to 300-feet in width along the eastern boundary of the South Hills subarea by requiring dedication of land as Urban Separator, while allowing density transfers from the Urban Separator to the developable portion of individual sites. Develop a strong gateway at I Street with landscape treatment and views of the Petaluma Valley. Preserve the existing public viewsheds featuring the Petaluma community.
10-P-3	Regulate the grading and development of hillside areas for new

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			urban land uses, by instituting a Hillside Overlay or other similar mechanism in the Development Code. Ensure that new development on hillsides is constructed to reduce erosion and landslide hazards: Limit cut slopes to 3:1, except where an engineering geologist can establish that a steeper slope would perform satisfactorily over the long term. Encourage use of retaining walls or rock-filled crib walls as an alternative to high cut slopes. Ensure revegetation of cut-and-fill slopes to control erosion. Plant materials for revegetation should not be limited to hydro-seeding and mulching with annual grasses. Trees add structure to the soil and take up moisture while adding color and diversity. Ensure blending of cut-and-fill slopes within existing contours, and provision of horizontal variation, in order to mitigate the artificial appearance of engineered slopes. Ensure structural integrity of sites previously filled before approving redevelopment.	
3.11-2	New development and intensification along the Petaluma River could adversely affect the visual character of this natural resource.	2-P-36	An area shown as the Petaluma River Corridor (PRC), along the Petaluma River, shall be set aside for the creation of flood terraces where appropriate, preservation, expansion, and maintenance of flood storage capacity of the floodplain, habitat conservation, and public access.	Less than Significant
		3-P-37	The Petaluma River Corridor (PRC) shall be dedicated to the City, improved and maintained in perpetuity by the development as adjacent development occurs. A. Design Standards shall be developed for the Petaluma River Corridor.	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	B. Maintenance of the PRC shall be assured through the creation of a funding mechanism such as citywide surface water utility fee or Landscape Assessment District.
	C. All development within the PRC shall be subject to a discretionary review process.
2-P-38	Development shall incorporate the River as a major design focal point, orienting buildings and activities toward the River.
2-P-39	Develop the Petaluma River as a publicly-accessible green ribbon, fronted by streets, paths, and open spaces, by implementing the Petaluma River Access and Enhancement Plan within the context of the PRC Design Standards.
3-P-28	Foster connections to the river from surrounding areas and ensure that new development adjacent to the river is oriented toward it.
3-P-32	Promote greater accessibility to the Petaluma River and vacant lands through road extensions, bikeways, and trails, including: Extending Burlington Drive northward across Lynch Creek, and consider other options to extend streets through to new developments. Requiring new development to be oriented to the river, and providing continuous public access to the riverfront.
3-P-35	Provide gateway improvements both east and west of the Highway 101 overcrossing of the Petaluma River.
	D. East of Highway 101, undertake a streetscape improvement program that incorporates new trees and vegetation, while maintaining a visual and physical connection to the Petaluma River.
	E. Preserve and expand river-dependent industrial uses, while improving appearance and screening from Petaluma Boulevard South.

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	F. Develop the terminus of the Caulfield Lane "southern crossing" with Petaluma Boulevard South as an emphatic gateway, with methods—such as a roundabout and more defined lane widths—to slow traffic and define entrance into the community and new neighborhoods.
3-P-36	Provide vistas eastward to the Petaluma River and across toward Sonoma Mountain.
3-P-50	Develop the Petaluma River as a publicly-accessible green ribbon, fronted by streets, paths, and open spaces, by implementing the Natural Environment and Water Resources elements and the Petaluma River Access and Enhancement Plan.
3-P-51	Foster connections to the river from surrounding areas and ensure that new development adjacent to the river is oriented toward it.
3-P-52	Use the Petaluma River Access and Enhancement Plan as the tool to implement the Petaluma River Corridor by maintaining setbacks, creating flood terraces where appropriate, and preserving floodplain and habitat conservation areas and other open spaces along the river.
3-P-53	Promote greater accessibility and views to Petaluma River through road extensions, bikeways, and trails, including: Requiring new development to be oriented to the river, and provide continuous public access parallel to the riverfront. Extending Industrial Avenue south of Corona Road. Requiring a new pedestrian/bicycle connection to the river east of Jessie Lane and intersecting with Petaluma Boulevard North. Requiring a new street connection to the river at, or near, the intersection of Gossage Avenue.

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			Requiring paths from the area of Jessie Lane southwest toward Magnolia Avenue to link with existing neighborhoods.	
3.11-3	New development and redevelopment activities may potentially degrade the existing visual quality of the city through incompatibilities with existing development in scale and/or character.	2-P-3	Preserve the overall scale and character of established residential neighborhoods. A. In addition to density standards, establish building intensity (floor area ratio) standards for residential development in the Diverse Low and Medium Density Residential districts, to prevent development out of scale with existing neighborhood context. *Actual standards are to be developed and maintained in the City's Development Code.*	Less than Significant
		3-P-42	Maintain the rural character to the west of this corridor [Petaluma Boulevard North, north of Shasta Avenue] by limiting density to primarily Rural Residential uses west and north of Gossage Avenue, and Low Density Residential uses south.	
		3-P-56	Preserve the rural aspect of the area by maintaining the existing density (Rural, Very Low and Low Residential) and land use patterns. A decrease in density through minimum lot sizes within the Development Code can achieve the desired transition.	
		3-P-99	Allow lot consolidation in residential areas only when finding that this will not negatively impact the existing neighborhood character.	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

	6-P-6	Neighborhood parks are donated, constructed, and maintained within the developing property(ies). In addition to the donation and improvements, park impact fees shall be paid to offset costs associated with developing, upgrading, and maintaining community parks. Transfer of density from the donated park acreage may be considered where deemed appropriated by the City Council. Revise the City's Municipal Code to require dedication of neighborhood park land, and construction of associated neighborhood park improvements, in addition to the payment of park impact fees, eliminating the reimbursement component for neighborhood parks. Establish a transfer of development rights (TDR) program that allows project proponents on whose sites new parkland locations are designated, to transfer development rights from portions of the site dedicated as public open space/park beyond required dedication/in lieu requirements (5 acres per 1,000 residents) to the remainder of the site at a ratio of 1.5 x base land use designation on the site, subject to approval by the City Council and provided the following criteria are met: The resulting park area meets the minimum size and location requirements shown in Table 6.1-8 and Figure 6-1; The park/open space is useful for recreational use, and not just leftover acreage; The park/open space is physically and perceptually available to the community-at-large, and not internal to the development; The resulting transfer will not unduly impact the

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			character of the neighborhood where the development is located; and The park/open space is not at the city's edge, adjacent to an urban separator.	
3.12-1	New development proposed under the General Plan has the potential to disrupt undiscovered archaeological resources.	3-P-7	Protect significant historic and archaeological resources for the aesthetic, educational, economic, and scientific contribution they make to Petaluma's identity and quality of life. A. Maintain the character of the Petaluma Historic Commercial District, which is listed on the National Register of Historic Places, by adhering to the city's Historic Commercial District Design Guidelines. B. Maintain the Oak Hill-Brewster Historic and "A" Street Historic districts as local architectural preservation districts. C. Develop floor area ratio and other design standards that relate overall building size and bulk to site area for Downtown, the Oak Hill-Brewster Historic District, and "A" Street neighborhoods. D. Develop historic preservation guidelines or standards for protecting historic quality structures that are not located within an existing historic district through initiating, requiring and/or encouraging formation of additional historic districts. E. The loss of existing and potential historic structures shall be minimized through strict enforcement of City policies requiring proposed demolition be reviewed by the Historic and Cultural Preservation Committee. All means shall be used to en-courage preservation and/or adaptive reuse or restoration of structures built in 1945 or earlier	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			(Resolution 2005-198 N.C.S. as thereafter amended). F. Ensure the protection of known archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archaeologically sensitive for Native American and/or historic remains. G. In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological remains are discovered.	
3.12-2	New infill development within previously built up areas in the City has the potential to impact sites of local historic importance and the overall historic setting of downtown.	3-P-7	Protect significant historic and archaeological resources for the aesthetic, educational, economic, and scientific contribution they make to Petaluma's identity and quality of life. A. Maintain the character of the Petaluma Historic Commercial District, which is listed on the National Register of Historic Places, by adhering to the city's Historic Commercial District Design Guidelines. B. Maintain the Oak Hill-Brewster Historic and "A" Street Historic districts as local architectural preservation districts. C. Develop floor area ratio and other design standards that relate overall building size and bulk to site area for Downtown, the Oak Hill-Brewster Historic District, and "A" Street neighborhoods. D. Develop historic preservation guidelines or standards for protecting historic quality structures that are not located within an existing historic district through initiating, requiring and/or encouraging formation of additional historic districts. E. The loss of existing and potential historic structures shall be minimized through strict enforcement of City policies requiring proposed demolition be reviewed by the	Less than Significant

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			Historic and Cultural Preservation Committee. All means shall be used to en-courage preservation and/or adaptive reuse or restoration of structures built in 1945 or earlier (Resolution 2005-198 N.C.S. as thereafter amended). F. Ensure the protection of known archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archaeologically sensitive for Native American and/or historic remains. G. In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological remains are discovered.	
3.13-1	Buildout of the proposed General Plan could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	10-P-13	Require compliance with Sonoma County's Integrated Waste Management Plan (ColWMP) as well as the Consolidated Unified Protection Agency (CUPA) program elements.	Less than Significant
		10-P-14	Prepare and maintain an inventory of environmentally contaminated sites to educate future landowners about contamination from previous uses. Work directly with landowners in the cleanup of these sites, particularly in areas with redevelopment potential. *The U.S. Environmental Protection Agency (EPA) in 2005 awarded the City of Petaluma two grants to address potential brownfield properties within the city. In addition, the City has applied to the EPA for a revolving loan fund grant to help developers, non-profits, and the City clean up brownfield sites.*	
		10-P-15	Establish special zoning designations and environmental review processes that limit the location of industry, research, and business facilities using hazardous materials. Require safe	

Table ES-5: Summary of Impacts and Proposed General Plan Policies that Reduce the Impact

			distances between these sites and residential areas, groundwater recharge areas (see General Plan Chapter 8: Water Resources), and waterways.	
3.13-2	Buildout of the proposed General Plan could create a significant hazard to the public or the environment through reasonably foreseeable accidental release of hazardous materials into the environment.	NA		Less than Significant

1 Introduction

This Program Environmental Impact Report (EIR) has been prepared on behalf of the City of Petaluma 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 proposed Petaluma General Plan. Petaluma is the lead agency responsible for ensuring that the proposed General Plan complies with CEQA.

1.1 PURPOSE AND USE OF THIS EIR

The EIR on the proposed General Plan has three purposes:

> First, the EIR will help the City of Petaluma 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 General Plan and its alternatives.
>
> Second, the EIR will inform residents and members of the City Council and Planning Commission of the environmental impacts of the proposed General Plan 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 Petaluma's land use regulations and other implementation actions, based on a balanced assessment of the environmental impacts of the proposed General Plan.

The EIR also identifies further measures that decision-makers may want to incorporate into the General Plan, or implementation programs to minimize the environmental effects.

The proposed General Plan consists of policies and proposals to guide the future growth of the City of Petaluma within its Planning Area (see Chapter 2, Project Description, for discussion and map of planning and jurisdictional boundaries). This Draft EIR evaluates the potential impacts of the adoption of the proposed Plan. This EIR will also be used as a reference for subsequent environmental review of specific plans, infrastructure improvements, zoning amendments, impact fees, and development proposals.

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 General Plan in order to provide the City Council, as the ultimate decision maker, 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 identifies mitigation measures to minimize significant impacts and evaluate reasonable alternatives to the proposed Plan. The "No Project Alternative" discusses the result of not implementing the proposed General Plan or any of the alternatives. An environmentally superior alternative also is identified as part of the alternatives analysis to inform the public – the ultimate decision makers on this project.

This Draft EIR will be used by Petaluma residents, elected officials, and City staff during the public review process. The Draft EIR and Final EIR, which includes responses to public comments received during the 45-day comment period, will be certified by the Petaluma City

Council prior to consideration of the proposed Petaluma General Plan. The proposed Plan and the EIR have been prepared concurrently and policies in the proposed Plan take into consideration the EIR discussion of impacts and mitigation measures.

1.2 THE GENERAL PLAN PREPARATION PROCESS

The General Plan update was initiated in August 2001. In order for the General Plan to accurately address community needs and values, a comprehensive public process of obtaining the input of residents, businesses, and property owners as well as City officials was central to the update process. This involved the sharing of information and ideas between elected and appointed officials, City staff, the planning consultants, and residents.

The first major step in the process was the preparation of the *Existing Conditions, Opportunities and Challenges Report* (ECOC), which was published in October 2002. The ECOC provides baseline information on the existing conditions in the City and its surroundings and it identified opportunities and challenges and preliminary planning issues that needed to be considered further during the General Plan process.

The next step involved the preparation and consideration of three alternative sketch plans illustrating different land use and transportation scenarios informed by comments received from other public forums and by technical studies conducted. These sketch plans were presented in the *Land Use and Mobility Alternatives* report. The first sketch plan included a focus on the intensification of development along the arterial corridors leading to Downtown and Central Petaluma. The second sketch plan focused on the provision of new housing opportunities connected to the Petaluma River corridor and the third sketch plan focused on locating and intensifying neighborhood centers dispersed throughout the City in an effort to meet the basic needs of neighborhoods. After deliberation of these alternatives, the City, with input from the public, determined that the City's land use distribution ought to include various elements from all three alternatives. This preferred land use distribution is included in the proposed General Plan as the Land Use Map.

1.3 PUBLIC PARTICIPATION AND REVIEW

An extensive series of public workshops were held starting in September 2001 and continuing through April 2004, to solicit public comment on preferences and issues surrounding the City of Petaluma. Workshops were held concerning specific issues (i.e., economic health, transportation and circulation, teen/youth concerns, etc.) to ensure in-depth coverage of all issues to be addressed by the General Plan update. Two public workshops were held in March and April of 2004 on the *Land Use and Mobility Alternatives* report. Public meetings with the City Council and the Planning Commission were also held at key points in the process to brief them on Plan concepts and solicit comments. A total of 41 workshops were held prior to the release of the Draft General Plan and this document. Newsletters were distributed to organizations and individuals, including City residents and property owners, business owners, developers, and service organizations. The City also provided information to the local newspaper on planning issues being addressed by the General Plan. The proposed General Plan reflects the desires, the decisions, and the work of the public.

The proposed General Plan will be considered by the Planning Commission and the City Council at public hearings following public review of this Draft EIR. If approved, the proposed Plan will become the City's new General Plan. As such, it will guide land use decision-making in the City to the year 2025, unless amended.

1.4 EIR APPROACH AND ASSUMPTIONS

The proposed General Plan EIR is a program EIR, defined in CEQA Guidelines §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 completed 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 20 year planning horizon. A program EIR has two major advantages for the general plan process. 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 the overall effects of the proposed General Plan within the Urban Growth Boundary: the analysis does not examine the effects of the potential site-specific projects that may occur under the overall umbrella of this program in the future. In fact, this EIR assumes that specific development projects and infrastructure improvement proposals submitted to Petaluma will necessitate an independent environmental assessment in accord with the requirements of CEQA. The nature of general plans is such that many proposed policies are intended to be general, with details to be later determined during implementation. Thus, many of the impacts and mitigation measures can only be described in general or qualitative terms.

In order to place many of the proposed General Plan policies into effect, the City would adopt or approve specific actions – zoning regulations, zoning map amendments, development impact fees, specific plans, capital improvement programs, development projects, etc. – that would be consistent with the policies and implementation measures of the Plan. This program EIR does not preclude the need for environmental review of specific plans and individual projects subsequent to Council adoption of the proposed General 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 General Plan is intended to be self-mitigating in that the policies and programs of the proposed Plan are designed to mitigate environmental impacts. This EIR clearly shows how the impacts of future development in Petaluma will be mitigated through implementation of the policies and programs of the proposed Plan. Any residual impact after implementation of these proposed policies and programs is identified as 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 General 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 General Plan EIR is based on the following key assumptions:

Full Implementation. This EIR assumes that all policies in the proposed General Plan will be fully implemented and all development will be consistent with the proposed General Plan Land Use Diagram. Key elements of the proposed General Plan include accommodating all growth within the Urban Growth Boundary (UGB) through infill of vacant and underutilized parcels and providing better connectivity between and within neighborhoods.

Buildout in 2025. This EIR assumes that buildout of the proposed General Plan will occur by 2025. It is understood that development under the proposed General Plan will be incremental and timed in response to market conditions. And while the proposed General Plan includes policies intended to control the amount and location of new growth, it does not include interim "phases" (development scenarios) as this is considered speculative.

1.5 ISSUES ADDRESSED IN THIS 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 Petaluma General Plan 2025 was issued on August 11, 2004, and the City received comments during the 30-day review period. The NOP is included as Appendix A of this EIR. These comments, along with input received during public workshops and meetings helped to identify the major planning and environmental issues and concerns in the General Plan and helped 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, the characteristics of the City, 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 the EIR:

Land Use

Transportation

Parks and Recreation

Public Services

Public Utilities and Energy

Hydrology, Water Quality and Flooding

Geology, Seismicity and Soils

Biological Resources

Noise

Air Quality

Visual Resources

Cultural Resources

Hazardous Materials

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

1.6 DOCUMENTS INCORPORATED BY REFERENCE

CEQA Guidelines §15150 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 Petaluma General Plan 2025 Draft EIR incorporates by reference the documents noted below, which are available at the City of Petaluma General Plan Administration Department, 27 Howard Street, Petaluma, CA 94952:

Petaluma General Plan 2025 Existing Conditions, Opportunities, and Challenges Report (October 2002) – This document provides baseline information on existing conditions in the City and its surroundings. It also describes opportunities, challenges and preliminary planning issues to be considered during the General Plan update process.

Petaluma General Plan 2025 Land Use & Mobility Alternatives (February 2004) – This document presents various land use and transportation alternatives that may be incorporated into the proposed General Plan.

Draft General Plan. The Draft Petaluma General Plan 2025, also referred to as the proposed General Plan, is the proposed project under consideration in this Draft EIR.

Other project and program EIRs that have been prepared for sites within the Petaluma UGB have been reviewed during preparation of this DEIR, including the EIR for the Central

Petaluma Specific Plan (dated March 2003), which is available for public review at the City of Petaluma Community Development Department.

1.7 ORGANIZATION OF THE DRAFT EIR

California Government Code §15120 et seq. mandates that the Draft EIR contain the following discussions:

Executive Summary;

Description of the proposed project;

Description of the physical environmental conditions in the vicinity of the project;

Consideration of significant environmental impacts of the proposed project, as well as the project's incremental effects on the combined cumulative impact;

Mitigation measures proposed to minimize the significant effects; and

Alternatives to the proposed project.

This Draft EIR is organized into the following main chapters:

Executive Summary. A summary description of the proposed project and alternatives and tabulation of all potential environmental impacts and proposed mitigation measures.

Chapter 1: Introduction. A discussion of State law relevant to the preparation of Environmental Impact Reports, purpose of the Draft EIR, overview of the General Plan process, issues addressed in the EIR, and assumptions used in the environmental analysis.

Chapter 2: Project Description. A statement of project objectives and a detailed description of the proposed City of Petaluma General Plan, including growth projections, future land uses, and goals and policies.

Chapter 3: Environmental Setting, Impact Analysis, and Mitigation. A comprehensive analysis and assessment of the environmental setting (existing conditions), potential environmental impacts, and mitigation measures of the proposed General Plan. The analysis is organized by major topic and each topic area includes an environmental setting, thresholds of significance, impacts, and mitigation measures.

Chapter 4: Impact Overview. A summary of significant unavoidable environmental impacts, irreversible environmental changes, growth-inducing effects, and cumulative impacts as well as impacts found not to be significant.

Chapter 5: Alternatives. A description and comparison of the impacts of the proposed General Plan and three alternatives: No Project Alternative, Infill and Arterial Development Focus Alternative, and River Corridor Development Focus Alternative.

2 Project Description

2.1 INTRODUCTION AND BACKGROUND

The project analyzed in this EIR is the proposed *Petaluma General Plan 2025*. A city's general plan has been described as its constitution for development; it establishes the framework within which decisions on how to grow, provide public services and facilities, and protect and enhance the environment must be made. The proposed plan is intended to address growth and development over the next 20 years.

California Government Code §65300 et seq. mandates that all cities prepare a General Plan that establishes policies and standards for future development, housing affordability, and resource protection. State law encourages cities to keep general plans current through regular updates. Further, each city's general plan must include the following seven elements: Land Use, Circulation, Housing, Conservation, Open Space, Noise, and Safety. Additional elements may be included in the General Plan, at the discretion of the City. As shown in Table 2.1-1, optional elements in the proposed Petaluma General Plan 2025 include Community Design, Character, and Sustainable Building, and Economic Health and Sustainability. The Housing Element was adopted in 2002 and is not subject to analysis in this EIR because no amendments to this element are proposed as part of this General Plan update.

This chapter provides background information regarding the regional location of Petaluma's Planning Referral Area (also referred to throughout this document as the Planning Area), as well as General Plan objectives and key themes/components of the proposed General Plan. Additional details are provided in the Plan itself. This project description provides the basis for the environmental analysis in Chapter 3.

Table 2.1-1: Required Elements and Petaluma General Plan Elements

Chapter #	*General Plan Element*	*Required by State Law*
2	Land Use, Growth Management, and the Built Environment	Land Use
3	Community Design, Character, and Sustainable Building	n/a
4	The Natural Environment	Conservation
5	Mobility	Circulation
6	Recreation, Music, Parks, and the Arts	Open Space
7	Community Facilities and Services	Land Use
8	Water Resources	Conservation
9	Economic Health and Sustainability	n/a
10	Health and Safety	Safety; Noise
11	Housing[1]	Housing

n/a = Not applicable; element is not required by State law.

1. Housing Element was adopted in 2002; no new policies are proposed as part of this General Plan.

2.2 REGIONAL LOCATION AND PLANNING AREA

REGIONAL LOCATION

Petaluma is located in southwestern Sonoma County, just north and east of the Marin County border. Petaluma's boundaries are defined by the surrounding landscape—the city originated along the banks of the Petaluma River, then spread outward over the floor of the Petaluma River Valley. The Valley itself is defined by Sonoma Mountain on the northeast and by the hills extending northward from Burdell Mountain on the west. To the south are the Petaluma Marshlands and beyond, the San Francisco Bay. The Petaluma River and U.S. Highway 101 divide the city on a north/south axis. U.S. 101 is an important north-south transportation route for the region, connecting the San Francisco Bay Area to Mendocino and Humboldt Counties. Figure 2.2-1 illustrates the city's regional location.

PLANNING AREA

Petaluma's Urban Growth Boundary (UGB) area encompasses a total of 10,300 acres. The UGB was established by voter approval as part of Measure I in November 1998, and ensures that urban development and provision of city water and sewer services are contained within the UGB through December 31, 2018.

The city's Planning Referral Area—unchanged from the 1987 General Plan—extends outside of the UGB, covering the 113 square-mile Petaluma River watershed within Sonoma County. The 20-year Urban Growth Boundary (UGB), the Sphere of Influence, and the city's municipal boundary are all contained within the Planning Referral Area. The Planning Area extends beyond areas contemplated for development, in order to provide adequate physical context for parts of the impact analysis. The planning area boundaries for the General Plan 2025 are illustrated in Figure 2.2-2.

Figure 2.2-1: Regional Location

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Figure 2.2-2: Planning Boundaries

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2.3 PURPOSE & OBJECTIVES OF THE PROPOSED GENERAL PLAN

CEQA Guidelines §15124(b) require a description of project purpose and objectives. The proposed General Plan is intended to respond directly to changes experienced in Petaluma since the preparation of the current General Plan. Completed in 1987, the existing plan has a horizon year of 2005, and although many of its policies are still relevant, much has changed since its adoption nearly 20 years ago. The proposed General Plan, which establishes a planning framework and policies out to a horizon of 2025, will replace the existing General Plan in all elements, except Housing.

PLAN OBJECTIVES

The proposed Petaluma General Plan objectives address issues related to physical development, growth, and conservation of resources in the Planning Area. Specifically, the proposed Plan:

Outlines a vision for Petaluma's long-range physical and economic development and resource conservation that reflects the aspirations of the community;

Provides strategies and specific implementing policies, programs, and actions that will allow this vision to be accomplished;

Establishes a basis for judging whether specific development proposals and public projects are in harmony with Plan policies and standards;

Allows City departments, other public agencies, and private developers to design projects that will enhance the character of the community, preserve and enhance critical environmental resources, and minimize hazards; and

Provides the basis for establishing and setting priorities for detailed plans and implementing programs, such as the Development Codes, the Capital Improvement Program (CIP), facilities and master plans, and redevelopment projects.

GUIDING PRINCIPLES

The unique challenges and opportunities Petaluma faces are reflected in the proposed General Plan's 14 Guiding Principles, which provide the basis for the goals, policies, and programs included in the Plan elements:

1. *Maintain a close-knit, neighborly, and family-friendly city.* The proposed General Plan envisions Petaluma as a city of strong neighborhoods. A guiding premise of the General Plan is that activities and facilities used on a frequent basis, such as stores and parks, should be easily accessible to residents. Land uses are designated to ensure balanced neighborhood development with a mix of uses, and provision of new parks and commercial centers in neighborhoods that presently lack them.
2. *Preserve and enhance Petaluma's historic character.* With more than 150 years of history, Petaluma offers a rich legacy of buildings and neighborhoods, left largely intact after the 1906 earthquake. The city's evolution along the Petaluma River has endowed it with a unique heritage of buildings, urban patterns, and landscapes afforded by a navigable waterway. Preservation and enhancement of the city's historic assets lends Petaluma a distinct identity, and helps sustain its small-town character. As future growth turns increasingly toward infill, efforts to guard the city's heritage need to be redoubled and are reflected in the proposed Plan's policies.

3. *Preserve and enhance Petaluma's natural environment and distinct setting in the region—a community with a discrete edge surrounded by open space.* Petaluma's built environment is shaped and influenced by its larger natural setting, which has long shaped the community's image and sense of place. Views of Sonoma Mountain on the northeast and the hills on the west, the Petaluma River and creeks, and the Petaluma Marshlands to the south are all distinctive elements of this setting. Ensuring that the city's surroundings are maintained in open space is more than an aesthetic issue; given the history of flooding, it is vital to the city's survival. Petaluma's Planning Referral Area encompasses the entire 113 square-mile Petaluma River watershed within Sonoma County. The proposed General Plan reinforces the City's commitment to sustainable development patterns by ensuring all future growth results from infill, and land outside the UGB is maintained primarily in agricultural and rural land uses, and open space.

4. *Enhance the Petaluma River corridor while providing recreational and entertainment opportunities, including through active implementation of the Petaluma River Access and Enhancement Plan.* The city's economic and development patterns have closely been associated with the river, and the River Plan acknowledges the central and multi-faceted role that the river plays in Petaluma's life. It also recognizes that the future economic, social, cultural, and environmental health of the city is intertwined with the river. The General Plan reinforces the city's identity as a river town, and incorporates the recommendations of the Petaluma River Access and Enhancement Plan, including accessibility, open space, habitat conservation, as well as riverfront uses, activities, and developments.

5. *Stimulate and increase public access and use of pathways as alternative transportation routes by providing a safe, efficient, and interconnected trail system.* Petaluma has an evolving pathway system centered on creeks, the Petaluma River and Urban Separator parcels. The General Plan calls for an expanded system of interconnected pedestrian and bicycle facilities to serve alternative transportation and recreational needs.

6. *Provide for a range of attractive and viable transportation alternatives, such as bicycle, pedestrian, rail, and transit.* With support for regional rail, an expanded trail and bikeway system, and conversion of two of the city's principal spines—East Washington Street and Petaluma Boulevard South—to pedestrian-oriented "boulevards," the General Plan seeks to increase alternative transportation choices. Establishment of minimum densities, promotion of infill development, and provisions for a mix of uses in all neighborhoods will also minimize auto dependency and support transit.

7. *Enhance Downtown by preserving its historic character, increasing accessibility and residential opportunities, and ensuring a broad range of businesses and activities.* The General Plan seeks to reinforce downtown's identity and role as the physical and symbolic center of the city by supporting continued intensification and diversity, linkages with the river and Central Petaluma, and improvements in use, intensity, and character along major thoroughfares leading to downtown.

8. *Foster and promote economic diversity and opportunities.* The evolution of Petaluma's economy, from river-dependent industry to high technology and "telecom valley" businesses, and the potential for increased tourism and retail are opportunities for the city to strengthen its economic base. Continued economic development is vital to accomplishing many of the General Plan's objectives. Its importance is underscored by the inclusion of an Economic Health and Sustainability Element (Chapter 9) that outlines the City's role in economic development and sets forth policies to implement these strategies.

9. *Expand retail opportunities to meet residents' needs and promote the city's fiscal health, while ensuring that new development is in keeping with Petaluma's character.* Expanding retail choices in Petaluma has been a top priority of residents in surveys and public workshops conducted for the General Plan. While growth in automobile dealers and supplies helped the City to

increase sales tax revenues dramatically during the 1990s, Petaluma has a shortage of general merchandise and "big ticket" outlets, as well as convenience shopping in many neighborhoods. The General Plan identifies several new locations, accessible locally and regionally, to close the gaps in Petaluma's retail offerings, while underscoring the need to integrate larger developments within the city's overall urban fabric.

10. *Continue efforts to achieve a jobs/housing balance, emphasizing opportunities for residents to work locally.* The General Plan seeks to continue Petaluma's past efforts to maintain a balance between job growth opportunities and housing inventory. This is further defined by policies to support local business incubation and home-based working. Transportation benefits can be derived if local residents can work and shop in the community.

11. *Foster a sustainable community in which today's needs do not compromise the ability of the community to meet its future needs. Promote green development.* The General Plan offers a broad vision of community quality of life and tools to measure progress toward that vision over time. In effect, the principles of sustainability are woven into each element of the General Plan—whether water resources, transportation, natural resource conservation, or housing. Policies and incentives to promote green development practices, promote infill and reuse, and sensitive site development practices are also included.

12. *Ensure infrastructure is strengthened and maintained.* Land use planning in the General Plan is complemented with a full assessment of the city's public infrastructure. Standards for capital facilities and public services—such as streets, parks, storm drainage and fire/safety—are established to ensure that growth does not exceed carrying capacity. To maintain the quality of public services for residents, development would be required to meet specific standards established by the Plan. In addition, the Annual Report on the General Plan will include progress made toward implementing the mitigations contained in the Plan's Environmental Impact Report (EIR).

13. *Integrate and connect the east and west sides of town.* The Petaluma River, the railroad tracks, and Highway 101 present barriers between the eastern and western portions of the city. Integration of different parts of the city is a theme that is reflected in several Plan policies. Roadway improvements and new streets are also proposed to link different neighborhoods, including two major east-west connections—the Rainier underpass/interchange and the Caulfield Lane "southern crossing"—to better integrate the east and west sides of town.

14. *Encourage cultural, ethnic, and social diversity.* The General Plan reinforces the city's diversity by providing a range of housing choices—from large-lot hillside homes to urban units adjacent to downtown or the Petaluma River—and opportunities for a variety of large and small-scaled business establishments.

2.4 CHARACTERISTICS OF THE PROPOSED GENERAL PLAN

This section outlines the key issues addressed in the General Plan and summarizes proposed land uses and buildout established in the General Plan Land Use Element.

KEY ISSUES

Through discussions with the various elected and appointed City officials and numerous interested residents, five key issue areas emerged as the plan took shape; proposed General Plan policies have been developed to respond to these topics in an integrated manner:

Economic Health. Ensuring diversity and balance of economic activities is essential to the economic health and fiscal sustainability of Petaluma. Of particular concern is the need to provide opportunities for new retail businesses not presently available within the city. The Leakage and Sustainable Retail Strategy Study (June 2004), identifies specific occupancy types as the "missing pieces" in Petaluma's retail mix, such as electronics, furniture, appliance and upper-end apparel, mixed-use centers and walking access to neighborhood retail. The policies and programs in the Economic Health and Sustainability Element (Chapter 9) of the General Plan provide specific direction for ensuring that retail diversity and intensification, as well as continued development of a diverse employment base is achieved.

Infill/Residential Growth Projection. Petaluma has been a pioneer in managed growth. This plan continues this practice by identifying land use designations and policies to provide an acceptable level of residential growth to complement the desired expansion of employment and retail opportunities. Providing for a balance of housing opportunities over the next 20+ years is a critical component of the new General Plan. Given the limited availability of land within the city's Urban Growth Boundary (UGB), an increase in residential densities in select areas of the remaining supply of vacant and under utilized lands and redefining existing uses are central aspects of this Plan. In addition, the General Plan, in conjunction with the Central Petaluma Specific Plan (June 2003), increases the amount of higher density mixed use projects, providing a significant amount of housing in the central area of the community with less consumption of land.

Water Resources. Public workshops on water resources identified common themes regarding management of surface water systems (i.e., creeks and rivers), including restoring wildlife habitat, keeping rivers and channels clean and free flowing, providing bicycle and walking paths along creeks and rivers, and minimizing flooding potential by providing greater capacity within and adjacent to the river channel. The City has and continues to put forth significant efforts, including the adoption and implementation of the Petaluma River Access and Enhancement Plan (May 1996). The limited supply of water and the maintenance of an aging water distribution system were analyzed to insure the ability to meet the future demands of the community. In 2001, the City Council directed the preparation of Water Resource Master Plans in conjunction with the new General Plan. Those work efforts have framed the preparation of the Water Resources Element (Chapter 8) of the General Plan. The Element provides the general objectives to insure all city water systems meet the present and future needs of the community, in an environmentally sensitive manner.

Mobility. The Petaluma River, Northwest Pacific Railroad, and Highway 101 traverse the city in close proximity to one another dividing the city into eastern and western segments. Cross-town connections between these two segments are extremely limited, and the

connecting roadways are major points of congestion. The Plan focuses on new linkages, as well as on reducing automobile dependence by supporting alternative modes of transportation, such as walking, bicycling, and transit, while promoting utilization of infill sites for diversified neighborhood-serving land uses.

Public Facilities and Parks. The Plan addresses the capability of existing city infrastructure (parks, community centers, cultural resources and amenities) to serve the 2025 community by weighing it against the physical and fiscal reality of providing expanded facilities, both passive and active.

GENERAL PLAN LAND USE MAP & LAND USE CLASSIFICATIONS

As stated in the Land Use Element of the General Plan, the following section describes the land use map for the Planning Area, land use classifications, and buildout projections.

General Plan Land Use Map

The land use framework of the proposed General Plan Land Use Element is illustrated in the Land Use Map (Figure 2.4-1). The Land Use Map designates the proposed general location, distribution, and extent of land uses within the UGB through buildout, which is expected by about 2025.

Density/Intensity Standards

As required by case law, land use classifications, shown as color/graphic patterns, letter designations, or labels on the Land Use Map, specify a range for housing density and building intensity for each type of designated land use.[1] Residential density is expressed as a minimum and maximum number of housing units per net acre (that is, exclusive of existing public streets and other rights-of-way), and for non-residential and mixed uses a maximum permitted ratio of floor area to net site area (FAR) is specified. FAR is a broad measure of building bulk that controls both visual prominence and traffic generation. It can be clearly translated to a limit on building bulk in the Development Code (the City's zoning regulations) and is independent of the type of use occupying the building. The Development Code could provide specific exceptions to the FAR limitations for uses with low employee densities, such as research facilities, or low peak-hour traffic generation, such as a hospital. In addition to density/intensity standards, some land use classifications stipulate allowable building types as well (such as single- or multifamily residential) to respect community design considerations.

The density/intensity standards do not imply that development projects will be approved at the maximum density or intensity specified for each use. Development regulations consistent with proposed General Plan policies and/or site conditions may reduce development potential within the stated ranges—for example steep slopes, floodplains, designated setbacks and other standards designed to ensure compatibility with the surroundings and address physical site constraints may limit maximum attainable densities.

1. Densities and FARs within the boundary of the Central Petaluma Specific Plan (CPSP) shall be undertaken in accordance with the CPSP.

Classification System

Land use classifications within the proposed General Plan Land Use Element are detailed below, and correspond to the Land Use Map in Figure 2.4-1. As stated in the proposed General Plan, they are meant to be broad enough to give the City flexibility in implementation, but clear enough to provide sufficient direction to carry out the General Plan. The City's Development Code contains more detailed provisions and standards. More than one zoning district may be consistent with a General Plan land use classification. Any changes to the land use designations require a General Plan Amendment.

Residential

Seven residential land use classifications are established to provide for development of a full range of housing types (mixed-use classifications that permit residential uses are included later in this section). Densities are stated as a number of housing units per net acre of developable land, excluding areas subject to physical, environmental, geologic, or other public health and safety constraints (for example, Floodway), provided that at least one dwelling unit may be built on each existing legal parcel designated for residential use.

The State's density bonus requirements (Government Code Section 65915) specifies that applicants are entitled to a density bonus of up to 35 percent of the maximum allowable residential density provided certain amounts of affordable housing is provided. The General Plan residential densities were established considering the possible increase in density as a result of this law. Development is required within the density range (both maximum and minimum) stipulated in the classification. Plan policies provide for exceptions in certain situations, such as where preservation of existing structures affects ability to meet minimum densities.

Secondary units (also known as accessory units or in-law apartments) permitted by local regulation and state-mandated density bonuses for provision of affordable housing are in addition to densities otherwise permitted.

Rural Residential (0.1 to 0.5 units per acre). Single-family residential development located primarily at the western perimeter of the city, along the Urban Growth Boundary. This designation maintains a rural character and provides a transition to unincorporated rural and agricultural lands. This density range reflects prevailing lot sizes and development patterns.

Very Low Density Residential (0.6 to 2.0 units per acre). Single-family residential development applied primarily to the southern hillsides, with a minimum lot size of half an acre, and larger lots required for sloped sites.

Low Density Residential (2.1-8.0 units per acre). Single-family residential development. This classification represents the majority of the existing stock of detached single-family dwellings.

Diverse Low Density Residential (6.1-12.0 units per acre). This classification encompasses the diversity of housing types and densities in the older neighborhoods surrounding downtown Petaluma. The density range represents an overlap between the Low and Medium densities, reflecting existing prevailing densities and structure massing.

Medium Density Residential (8.1-18.0 units per acre). This classification provides for a variety of dwelling types, including single-family and multi-family housing.

High Density Residential (18.1-30.0 units per acre). This designation would permit the full range of housing types, but is intended for multi-family housing in specific areas where higher density is considered appropriate.

Mobile/Manufactured Homes (8.0 – 18.0 units per acre). Residential home developments of eight or more mobile home units. Mobile or manufactured homes are the only allowed housing type.

Commercial

Neighborhood Commercial (0.8 maximum FAR). Neighborhood Commercial provides for shopping centers, typically 10 acres or less in size, with off-street parking, or clusters of street-front stores that serve the surrounding neighborhood.

Community Commercial (1.2 maximum FAR). This category includes shopping centers and commercial districts, including regionally-oriented centers.

Mixed Use (outside of the CPSP)

Mixed Use (2.5 maximum FAR). This classification supports a variety of uses, including retail, residential, service commercial, and offices. Development is oriented toward the pedestrian, with parking provided, to the extent possible, in larger common areas or garages. Maximum FAR including both residential and non-residential uses[2] is 2.5, and maximum residential density is 30 d.u./acre.

The Community Design, Character, and Sustainable Building Element provides direction as to the intent of the Mixed Use classification in certain areas of the city. For example, along corridors such as Washington Street and Petaluma Boulevard the intent of mixed use is to recognize a broad range of uses along those corridors including both commercial and residential uses; a mixture of uses on each individual parcel is encouraged but not required.

Densities and FARs within the boundary of the Central Petaluma Specific Plan (CPSP) shall be undertaken in accordance with the CPSP.

Business Park

Business Park (1.5 to 3.0 variable maximum FAR). This classification is intended for business and professional offices, technology park clusters, research and development, light industrial operations, and visitor service establishments, with retail only as a secondary use. The maximum FAR is 1.5, although an FAR of 3.0 is attainable if all required parking is structured. Refer to the Development Code for more details.

Industrial

Industrial (0.6 maximum FAR). This designation is intended to provide and protect industrial lands for the full range of manufacturing, industrial processing, general service, warehousing,

2. This FAR is simply calculated by dividing total floor area of all uses—residential and non-residential, but excluding parking—by the site area.

storage and distribution operations. Small restaurants and service commercial may be allowed as ancillary uses, subject to appropriate standards.

Agriculture. Lands that are actively and primarily used for grazing, or the production or sale of food and fiber. Parcels subject to seasonal or historic inundation and identified by FEMA as areas warranting special consideration are included.

Agricultural Support Industry (maximum FAR as per the CPSP). This designation allows for food processing, feed mills and related industrial uses which provide direct support to agricultural uses located in the Petaluma area. Agricultural uses include traditional dairy and poultry operations, but may also include organic farming and food processing and any other related uses that are consistent with supporting local agricultural production. All sites of this designation are within the boundaries of the Central Petaluma Specific Plan.

River-Dependent Industrial (maximum FAR as per the CPSP). Heavy industrial manufacturing, raw material processing and related uses that require river access as an integral part of daily operations for the purpose of regularly shipping or receiving raw materials and finished products by water transport. Businesses that locate on properties with this designation shall be dependent on the Petaluma River for transporting a significant portion of its goods and materials.

Public and Educational

Public/Semi-Public. Public/Semi-Public includes proposed gateways, public utility facilities, government offices, and community service uses and lands.

Education. Education contains lands owned and operated by the elementary, secondary, or community college districts, as well as private and/or parochial schools. The Education classification does not include preschool facilities, nor does it preclude future development regulations from allowing public or private schools in any other designated areas.

Park and Open Space

City Parks. City Parks are City-owned lands whose primary purpose is recreation. Neighborhood parks are intended to typically serve the daily recreational needs of people living or working within a half-mile radius, while community parks are intended to serve the entire city. Proposed park facilities are identified with a special symbol; acreage of proposed parks is site specific and addressed within the Recreation, Music, Parks, and the Arts Element.

Open Space. This designation includes unimproved sites devoted to the preservation of natural resources, outdoor recreation, or public health and safety.

Figure 2.4-1: GP Land Use Map

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Urban Separator. The Urban Separator includes open space lands within and/or directly adjacent to the Urban Growth Boundary that are intended to serve as the outer boundary of urban development, as designated by the City of Petaluma. They provide an edge that buffers agricultural fields from urban land, may serve as a recreational area, and act as a key component of the city's open space system. On lands with development potential, the Urban Separator is an overlay designation, with transferability of development potential to the remaining portion of the same property.

Floodway. Floodway delineates the channel of the Petaluma River or other watercourse and the adjacent land areas that must be reserved in order to discharge the "base flood" without cumulatively increasing the water surface elevation more than one foot. No new development is allowed.

The boundary of the Floodway is determined by the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM); amendments to the FIRMs will be subsequently reflected on the City's General Plan Land Use Map. The Petaluma River Access and Enhancement Plan (adopted 1996) and the future Surface Water Master Plan address the Floodway and Floodplain areas in greater detail than the General Plan.

Overlays

Floodplain. The Floodplain represents lands subject to periodic inundation in a 100-year storm event, as defined by the FEMA Flood Insurance Rate Maps. The Floodplain delineation is intended as an overlay for informational purposes and to distinguish properties subject to regulations outlined in the Development Code.

Petaluma River Corridor. Areas determined to be needed for the implementation of the adopted Petaluma River Access and Enhancement Plan (1996) and to provide for future floodplain management projects. Development potential may be transferable, subject to other applicable policies and regulations.

Urban Separator Path. Identifies locations where the fee title dedication of an Urban Separator may not be feasible but provision of an improved pathway for connectivity is desired and/or appropriate.

Symbols

Transit. A transit station site for the regional transportation system (rail, light rail, trolley, and/or bus) existing or proposed along the highway or existing railroad right-of-way, or an existing or proposed vehicular and bicycle park-and-ride facility.

Gateway. A Gateway indicates public and private property that serves as an important entrance to the city. It is intended that treatment of these gateways, through signs, landscaping, and/or public amenities will provide a sense of introduction and entry into Petaluma.

County Designations

County Park. The County Park classification delineates Sonoma County's Helen Putnam Regional Park, located along the southwestern edge of Petaluma's Urban Growth Boundary.

Community Separator. The Community Separator includes lands located outside of the Urban Growth Boundary that are intended to serve as a buffer between adjacent cities, as designated by Sonoma County and the City of Petaluma. Land uses are permitted on these lands under the Sonoma County General Plan.

BUILDOUT UNDER THE PROPOSED GENERAL PLAN

Full development under the proposed General Plan is referred to as "buildout." Although the proposed General Plan applies a 25-year 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 use necessarily mean the site will be built/redeveloped with that use in the next 25 years. Refer to the Land Use Element of the proposed General Plan for more detailed analysis of General Plan buildout.

This section describes the implications of the proposed General Plan buildout in terms of future new population, housing units, and jobs, based on land use designations on the proposed Land Use Map. Adequate land is provided by the proposed General Plan to accommodate anticipated housing and job needs in Petaluma through 2025. Table 2.4-1 shows the buildout acreage and distribution of the proposed General Plan Land Use Map. Key land use changes include the increase in residential and mixed use land areas. Additional mixed use land will allow for a greater flexibility in downtown, Central Petaluma, and along major arterial corridors.

Table 2.4-1: Land Use Acreages Plan Buildout

Land Use[1]	*Acreages*
Residential	4,348
Commercial	290
Mixed Use	542
Industrial	188
Business Park/Office	512
Public and Educational	1,447
Parks and Open Space	1,319
Vacant	0
Total	**8,646**

1. Land use acreage does not include streets, river, or areas outside of the UGB.

Residential and Non-Residential Development

Tables 2.4-2 and 2.4-3 compare the additional housing units and non-residential building area expected to occur under the proposed General Plan buildout. As shown, the proposed General Plan will result in approximately 6,000 additional housing units for a buildout total of 27,949 units. The Plan is also intended to accommodate an additional 6.1 million square feet of non-residential space, resulting in approximately 23 million square feet of non-residential floor area in Petaluma. Development under the proposed Plan represents a 27 percent increase in housing units and about a 36 percent increase in non-residential building based on existing, approved development, planned CPSP buildout, and future development under the proposed General Plan.

Table 2.4-2: Estimated Housing Units at Plan Buildout

Existing (2005)	21,944
Increase to Buildout[1]	6,005
Total Housing Units	**27,949**

1. Includes those sites where projects are currently under construction, approved, or in formal review.

Table 2.4-3: Non-Residential Development at Plan Buildout (sf. ft.)

	Existing (2005)	*Increase to Buildout*	*Total at Buildout*
Commercial/Retail	4,195,000	2,871,000	7,066,000
Office	5,965,000	2,681,000	8,646,000
Industrial	5,291,000	574,000	5,865,000
Institutional	1,406,000	-	1,406,000
Total	**16,857,000**	**6,126,000**	**22,983,000**

Table 2.4-4: Density and Intensity Assumptions Used in Buildout Projections

Land Use	*Max FAR*	*FAR/Density used*[1]		*Range*	*Density used*
Mixed Use:			**Residential:**		
Mixed Use	2.5 [all uses]		Rural	.01- 0.5	0.3
Commercial		0.2	Very Low Density	0.6 - 2.0	1.2
Office		0.2	Low Density	2.1- 8.0	5.5
Residential		8 units/acre	Low Diverse	6.1-12.0	10
Mixed Use - Core	2.5 [all uses]		Medium Density	8.1- 18.0	13
Commercial		0.4	High Density	18.1- 30.0	22
Office		0.1	Mobile Homes	No new sites proposed	
Residential		15 units/acre			
Commercial/Industrial:					
Community Commercial	1.2	0.4			
Neighborhood Commercial	0.8	0.35			
Business Park	1.5 - 3.0				
Office		0.35			
Industry		0.3			
Ag Support Industry	0.6	0.2			
River Dependant Industry	0.6	0.2			
Industry	0.6	0.2			

1. The intensities assumed in this table are generally higher than the prevailing intensities. In addition, some of the highest non-residential densities will require structured parking, which is unlikely to occur in the near-term (outside of Central Petaluma) given the prevailing land prices. However, there is a possibility that higher densities could be developed in a few select locations or in the longer term. Therefore, the designated FARs preserve the possibility for higher intensity infill development while portraying a realistic picture of largely surface parking for most non-residential development in the coming decades.

Population and Employment

Table 2.4-5 summarizes the buildout population and employment under the proposed General Plan. These projections are based on estimates of housing units and non-residential building floor area, which are derived from the acreage estimates (Table 2.4-1), and density and intensity assumptions (Table 2.4-4).

At buildout, Petaluma will have added approximately 15,600 residents to the city, reaching a total buildout population of 72,707. This represents an overall annual growth rate of about 1.2 percent over the next 20 years, a slower rate than that experienced by the city over the last 20 years (1.8%). Petaluma's population grew by 41 percent between 1985 and 2005; the proposed General Plan represents a 27 percent increase over the next 20 years.

Along with population growth, non-residential building space in Petaluma will increase from an estimated current (2005) 16.9 million square feet to 23 million square feet at buildout (an increase of 36 percent), accommodating a comparable increase in employment—from 33,160 currently to 46,540 at buildout (an increase of 40 percent).

A city's job/housing ratio (jobs to employed residents) would be 1:1 if the number of jobs in the city equaled the number of employed residents. In theory, such a balance would eliminate the need for commuting. As shown in Table 2.4-5, the current jobs/housing ratio in Petaluma is 1.12, meaning that the number of jobs in the city exceeds the number of employed residents by about 12 percent. Despite this, the 2000 Census shows that the majority (over 60 percent) of employed residents continue to commute to work outside the city. While the jobs/housing ratio expected at Plan buildout will decrease to 1.05, the General Plan seeks to improve this balance by providing a diversity of employment opportunities within the city as well as by providing for alternative modes of travel.

Table 2.4-5: Population and Employment

	Estimated 2005	*Increase to Buildout*	*Buildout 2025*
Population			
Total Population	57,085[1]	15,622	72,707
Household Population	56,286	15,402	71,689
Total Jobs	**33,160**	**13,380**	**46,540**
Jobs/Housing Balance			
Employed Residents	29,700	14,750	44,450
Jobs/Employed Residents Ratio	1.12		1.05

Assumptions: 5% housing vacancy rate; 2.7 persons per household; household population as 98.6% of total population.

1. Population estimate includes all areas within the UGB.

Source: ABAG Projections 2005, DOF 2005, Dyett & Bhatia, 2006.

2.5 KEY POLICY DIRECTION

The following section describes the key characteristics and policies of each element of the proposed General Plan.

LAND USE, GROWTH MANAGEMENT, AND THE BUILT ENVIRONMENT

The Land Use Element of the proposed General Plan outlines the framework that guides land use decision-making, provides the General Plan Land Use Map and land use classification system (as described in Section 2.4), and includes citywide land use and growth management policies.

Recognizing the limited availability of land within the UGB, new development under the proposed General Plan seeks to infill and intensify existing vacant and underutilized sites that are not environmentally constrained. Consequently, development is targeted in neighborhood

centers and corridors while ensuring that established areas are not unduly impacted. Similar to the 1987 General Plan, the proposed Plan focuses on strengthening downtown as the civic, commercial, and cultural center of the city. Several major corridors, including East Washington Street and Petaluma Boulevard, are designated with mixed retail, office, and residential uses. Constrained by hillsides and the UGB, development in the western edge of the city is primarily Rural, Very Low, and Low Density residential. Business Park and Industrial uses are maintained and supported as employment centers. Key policies of this element also include the establishment of hillside development and design standards to preserve the ridgelines and hillsides that define Petaluma.

All land use policies are based on the premise that growth will occur within the present UGB until 2018, at which point the voter-approved UGB will expire. The General Plan provides direction for systematic evaluation of growth boundary expansion issues, with greater analysis needed at the time of midterm review in 2015. This will include an assessment of available vacant land, infrastructure capacity, growth trends and projections, as well as economic and housing needs.

Lands addressed in area plans, such as the Central Petaluma Specific Plan, are generally maintained as in the plans, and unincorporated sites located outside the UGB reflect Sonoma County General Plan designations.

COMMUNITY DESIGN, CHARACTER, AND SUSTAINABLE BUILDING

This element includes policies aimed at protecting and enhancing the physical environment (both natural and created) that has helped shape the city's identity. Included among these physical elements are the city's setting, general distribution of neighborhoods and land uses, open space amenities, and historical resources. On a more detailed level, the discussion outlines policies for each of Petaluma's 14 planning subareas. Policies focus on establishing strong linkages between different parts of the city to the Petaluma River, and standards to ensure pedestrian-oriented uses in downtown and along mixed-use arterials.

Sustainable Building policies promote sustainable and environmentally appropriate site planning practices as well as the creation of green building guidelines.

THE NATURAL ENVIRONMENT

Petaluma is a city defined by the natural environment. Preservation of open space areas and significant natural resources (e.g. Petaluma River, ridges) are key features of the Natural Environment Element. Policies protect the city's natural landscape from significant alteration of topography, drainage patterns, and vegetation. Wetlands, vernal pools, and wildlife ecosystems are protected from encroachment. A key policy of this element calls for updating the City's Development Code to implement the River Access and Enhancement Plan. In addition, Natural Environment policies propose actions to reduce air quality emissions, improve energy efficiency in existing and new structures, and expand waste reduction and recycling programs.

MOBILITY

The Mobility Element identifies long-range transportation needs, addressing bicycle, motor vehicle and pedestrian travel as well as public transit, rail, air, and water travel. A key policy includes new roadway classifications that outline the appropriate number of lanes, right-of-way and sidewalk widths, and desired speed for six types of roads. The element identifies future

circulation improvements, including providing cross-town mobility enhancements that make crossings of U.S. 101, the Northwest Pacific Railroad tracks, and the Petaluma River easier and more convenient. In addition, the establishment of a transportation demand management program, as called for in the element, will help reduce peak period traffic within Petaluma.

Mobility policies promote a pedestrian environment that is safe and attractive, as well as a bicycle network free of gaps that permits easy travel to all schools and major city destinations. Provision of transit system improvements (commuter rail and bus transit) and coordination between transit agencies ensure a convenient and efficient transit network.

RECREATION, MUSIC, PARKS, AND THE ARTS

The Recreation, Music, Parks, and the Arts Element focuses on the provision of city and county parks, music opportunities, and access to the arts for all Petaluma residents and workers. Policies propose a variety of parks and recreation facilities distributed throughout the community with pedestrian and bicycle paths connecting park facilities. A standard of five acres of neighborhood and community parks per 1,000 residents is maintained. One key factor in the expansion of the city's open space facilities is the establishment of a TDR program, which allows landowners to transfer development rights from sites designated as new parkland. Finally, Music and Art policies seek to promote and develop facilities to house visual and performing arts activities. The Public Art Committee will advise the City Council on installation of art in public places, marketing and tourism, and funding sources for art education.

COMMUNITY FACILITIES AND SERVICES

The Community Facilities and Services Element includes policies related to public facilities and services, educational facilities, and emergency management. Key proposals include investigating alternative approaches to making the Marina financially sustainable, supporting the continued operation of the Petaluma Airport, and working with public, private, and non-profit agencies to ensure facilities and services meet the needs of the community. Additionally, integrated planning efforts between local school districts and City staff ensure provision of adequate school sites and amenities to meet the needs of the student population.

Finally, the Community Facilities and Services Element addresses emergency preparedness and management, including maintaining adequate fire and police protection, hospitals, and health care facilities.

WATER RESOURCES

The Water Resources Element focuses on the city's water supply and demand, water distribution, and surface water management. The water supply and demand policies present a plan for providing Petaluma's residents and businesses with a safe, reliable, and high quality source of water through 2025 and beyond, using a mix of imported water, recycled water, water conservation, and groundwater.

Water Resources policies address the continued maintenance of the City's storage and distribution system in order to insure reliable delivery of high quality water for daily and emergency needs. Policies allow for surface drainage and flood protection facilities, including the construction of a flood terrace system. In addition, policies aim to reduce pollutant load in

surface water runoff, thereby improving the water quality within the Petaluma River and its tributaries.

ECONOMIC HEALTH AND SUSTAINABILITY

The Economic Health and Sustainability Element focuses on fostering economic vitality, diversity and opportunity and furthering community sustainability. Policies in this element are designed to strengthen and expand the local retail sector as well as to enhance the vibrancy and attractiveness of downtown Petaluma. This element allows for the provision of adequate sites and incentives for business expansion and attraction to the city. Expressing Petaluma's commitment to economic sustainability, the City will promote economic development that is environmentally, socially, and fiscally sustainable.

HEALTH AND SAFETY

The Health and Safety Element seeks to minimize risks posed by environmental hazards that may impact Petaluma resident's health, safety, and welfare. Issues addressed include geologic and seismic hazards, noise, and hazardous materials. Health and Safety policies address preservation of life and property through appropriate geotechnical analysis and mitigation during project planning and development, and prevention of potential human contact with hazardous materials through safety in the use, transport, and disposal of hazardous materials. Policies in this element also aim to reduce community noise levels wherever possible, and to minimize the impacts of noise on existing and new development.

2.6 IMPLEMENTATION OF THE PROPOSED GENERAL PLAN

The proposed General Plan provides specific policy guidance for implementation of plan concepts in each of the Plan elements and establishes a basis for coordinated action by the City, adjacent jurisdictions, Sonoma County, and regional and state agencies. Following approval of the proposed General Plan, City staff will prepare an Implementation Program for City Council information, to be used for future planning and budgeting.

This work program and schedule will be updated annually as part of the budget process and included in the Annual Report on the proposed General Plan. For each implementation policy, the Implementation Schedule will show when it would be implemented, whether it is a high priority action, who would be responsible, what City document would be affected, what the estimated cost would be, and if separate or supplemental funding is needed. In many cases, the implementation costs would be part of the normal costs of city operations.

ANNUAL REPORT

California Government Code §65400(b) requires that an annual report be submitted to the City Council on the status of the General Plan and its implementation. Such reports will also include any mitigation monitoring and reporting requirements prescribed by CEQA identified in this EIR since they are closely tied to Plan implementation. As a charter city, Petaluma is not required to provide an annual report; however, a Petaluma General Plan report will be prepared by City staff during the early stages of the budget process and submitted for review to the Planning Commission and City Council.

DEVELOPMENT REGULATIONS

The major implementation process for the land use proposals will be administration of the Development Code through the Zoning Map. The Code and Zoning Map will need to be amended to be consistent with policies of the proposed General Plan. Other City codes and regulations, such as the Subdivision Ordinance, will also need to be reviewed for consistency with the proposed Plan and amended, where needed. This effort should be completed within 18 months of the proposed Plan adoption.

CAPITAL IMPROVEMENT PLAN

The City's Capital Improvement Program will be the primary means of scheduling and funding infrastructure improvements of citywide benefit. Special benefit assessment districts or other means of financing improvements benefiting specific areas may be used. In some areas, implementation of the proposed General Plan will depend on actions of other public agencies and of the private sector, which will fund most development expected in the Planning Area. The General Plan will serve a coordinating function for private sector decisions; it will also provide a basis for action on individual development applications.

2015 REVIEW

Policy 2-P-33 of the Land Use Element of the General Plan requires a midterm review of the Plan in the year 2015, including a comprehensive assessment of the Urban Growth Boundary, which expires in 2018.

3 Environmental Setting, Impact Analysis, and Mitigation

This chapter of the Draft EIR provides information on the existing environmental setting within the Petaluma Urban Growth Boundary (UGB), as well as an analysis of potential environmental impacts that could occur with implementation of the proposed General Plan. The analysis is organized by environmental issue area.

Thresholds of significance are established, beyond which impacts are considered to be significant. The thresholds of significance are based on normally accepted standards for environmental review, pursuant to CEQA Guidelines. While the criteria for determining significant impacts are unique to each issue area, the classification of the impacts is uniformly applied in accordance with the following definitions:

> **Significant.** An adverse and substantial effect on the environment, where even with application of proposed General Plan policies, it cannot be reduced to levels that are less than significant.
>
> **Potentially Significant.** An adverse and potentially substantial impact, but one that can be reduced to a level that is less than significant with implementation of General Plan policies.
>
> **Less than Significant.** An adverse effect that is not considered substantial.

Many policies in the General Plan (as summarized in Chapter 2: Project Description) are designed to reduce environmental impacts. In this way, the General Plan is self-mitigating. The proposed General Plan policies that mitigate the potential impacts follow each impact analysis discussion.

The impact analysis assumes implementation of the proposed General Plan through year 2025, and does not analyze interim development phases. It is understood that development will occur incrementally through growth management policies that ensure urban growth is balanced with infrastructure provision and natural resources preservation over the next 20 years. The City's voter-approved Urban Growth Boundary (UGB) will expire in year 2018; however, the General Plan assumes continuation of the UGB through the 2025 timeline. If a new UGB is implemented upon expiration of the existing boundary, new review of environmental impacts would be required.

3.1 LAND USE

This section presents the existing setting and impact analysis on land use within the Petaluma Urban Growth Boundary (UGB).

ENVIRONMENTAL SETTING

Physical Setting

The city's current land use pattern is defined by its historical growth. Distinct residential neighborhoods illustrate architectural and site design trends, encompassing more than 150 years of evolution. Downtown and surrounding older neighborhoods, with smaller residential lots and alleys between some blocks, provide a walkable urban core. Heavy commercial, industrial, and warehouse facilities are clustered along the Petaluma River corridor, where access to shipping facilities was important through the mid-1900s. Large commercial shopping areas and business/industrial parks are located along the Highway 101 corridor. East of the highway, residential neighborhoods built starting in the 1960s are designed around schools, parks, and creek trails.

Existing Land Use

The general distribution of land uses within the City's Urban Growth Boundary (UGB) is tabulated in Table 3.1-1; the land use categories are defined in Chapter 2, Project Description. Figure 3.1-1 illustrates existing land uses within the City's UGB.

Petaluma's existing land use distribution is dominated by residential land uses. Older residential neighborhoods were developed west of the Petaluma River in the late 1800s and early 1900s. After Highway 101 was constructed in the 1950s, new suburban neighborhoods expanded to the east. Within the City's UGB, 44 percent of all land (net of streets and other rights-of-way) is devoted to residential uses; 40 percent of the total acreage consists of single family residential neighborhoods.

Commercial uses were developed along Petaluma Boulevard and Lakeville Highway, with access from Highway 101 provided in the 1950s. In the past few decades, businesses have also located along East Washington Street and McDowell Boulevard. These four corridors, along with Downtown, constitute the city's major commercial areas. Commercial land uses total approximately eight percent of the city's land area.

Industrial uses were historically concentrated east of Downtown, on sites along the Petaluma River with shipping and rail access. Light industrial activities are also clustered in business parks at the northern and southern edges of Petaluma adjacent to Highway 101. Industrial uses constitute six percent of the city's total acreage.

Public lands comprise approximately 16 percent of the city's acreage. Institutional uses—including Petaluma Valley Hospital, Sonoma-Marin County Fairgrounds, and Petaluma Municipal Airport—comprise ten percent of the city's total land area.

Open space constitutes a significant portion of the city's acreage – approximately 18 percent. Three golf courses, Shollenberger Park, and Helen Putnam (a county park) contribute to this open space acreage. Two percent of total land area comprises City-owned parkland, while another six percent comprises private recreation facilities and partnerships.

Agricultural lands, located in the northern tip of the city, comprise approximately 77 acres, less than one percent of the land within the Petaluma UGB.

Table 3.1-1 Petaluma UGB: Existing Land Use Acreage (2005)

Use Name	*Acreage*	*% of Total*
Residential	**3,786**	**44%**
Single Family	3,509	
Multifamily	128	
Senior Housing	141	
Mixed Use	**8**	**<1%**
Commercial	**657**	**8%**
Strip Commercial	210	
Shopping Center	122	
Office	279	
Hotel/Motel	10	
Heavy Commercial	36	
Industrial	**398**	**5%**
Light Industrial	177	
Warehouse	43	
Heavy Industrial	178	
Public	**1,400**	**16%**
Institutional	1,092	
Education	308	
Open Space	**1,554**	**18%**
City Parks	201	
Regional Parks	256	
Partnership/Priv. Recreation	493	
Open Space	527	
Agriculture	77	
Vacant	**836**	**10%**
Total Acreage	**8,639**	**100%**

Note: Land use acreage does not include streets, river, or areas outside of the UGB.

Source: City of Petaluma, 2006.

UGB Expansion Areas

In 1998, Petaluma voters approved four possible UGB expansion areas—totaling 330 acres—as part of the adoption of the Urban Growth Boundary. These four possible expansion areas are intended to serve as areas eligible for new development, should land availability within the existing UGB be constrained and adequate public service capacity be made available. The proposed General Plan does not recommend any uses for the expansion areas through the year 2025.

Planning Subareas

Petaluma's UGB is divided into 14 planning subareas. The planning subareas were selected by City staff and consultants based on land use patterns and development character, density/intensity, availability of vacant land, and similarity of opportunities and/or challenges.

Central Petaluma Specific Plan

The Central Petaluma Specific Plan (CPSP) subarea, which is approximately 400 acres in size, is located at the heart of the City and is characterized by the Petaluma River and the Turning Basin, an active rail corridor with transit potential, and adjacent industrial and commercial uses. It contains a portion of the city's Downtown that fronts the River.

The northern and eastern sections of the CPSP area include the City's corporation yard, animal shelter, and wastewater treatment plant. Warehouse and light industrial uses mix with new office and residential development in the blocks west of the River in an area historically referred to as the "warehouse district." Commercial uses lie primarily near the Turning Basin and along Petaluma Boulevard South.

The CPSP area has extensive vacant land, particularly near the Turning Basin, between Lakeville Street and the River, in the warehouse district, adjacent to Highway 101 interchange and along McNear Peninsula. The Central Petaluma Specific Plan, adopted by the City on June 2, 2003, calls for a single mixed-use designation throughout the subarea, along with the creation of four new zoning districts to reflect the diversity of opportunities. The City has developed development standards, using a SmartCode© concept, to regulate building intensity through the Specific Plan area.[1]

1. The SmartCode© provides a system for ensuring that the design of the public realm and the design of private buildings are coordinated and are focused on the pedestrian experience through an agreement between the community (the public) and property owners (the private). The community commits itself to building and maintaining high-quality, pedestrian-oriented streets, public parking facilities, squares, plazas, and riverwalks, while the property and business owners commit themselves to constructing high-quality buildings that face the public realm with facades maintained at a pedestrian scale and with on-site parking and service functions oriented behind buildings and the interiors of the blocks. City of Petaluma, *Central Petaluma Specific Plan,* Appendix A, June 2, 2003.

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Figure 3.1-1

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Figure 3.2-2 Subareas

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Lakeville Highway

A majority of the approximately 1,082 acres in the Lakeville Highway subarea consists of public uses and open space, including the City's water recycling facility, the Petaluma Marina, and Shollenberger Park. The recycling facility is located on a large, separate parcel south of the existing city limits, which contains numerous recycled water ponds. The City is currently constructing the water recycling facility and it is expected to be on-line in 2009. The Petaluma Marina contains a small-craft harbor and privately-owned office complex.

Shollenberger Park, a large wetlands area, comprises a majority of the open space in the subarea. Used as a dredge disposal site for the Petaluma River, walking trails have been constructed around its perimeter and wildlife habitat has been preserved. Only the small 16-acre strip of land containing the walking trail is designated for public recreation; all other land within the wetlands is reserved for dredge disposal.

Office and light industrial uses are clustered within the Lakeville Business Park along the city's eastern boundary. Several large, vacant lots interspersed within the Business Park are being developed with office uses. In addition, a new mixed use development project, Park Central, was recently constructed between Lakeville Highway and Shollenberger Park containing 240 housing units.

North East

The 1,149-acre North East subarea, home to about 13,000 residents, is comprised largely of single family residential neighborhoods and related open space networks. Constructed during the 1980s and 1990s, North East neighborhoods feature one- and two-story houses on curvilinear streets with local parks and other recreational amenities. Walking trails that provide linkages between neighborhoods, open spaces, and other local destinations include those along Lynch, Corona and Capri Creeks. Additional paths are located within the urban separator along the UGB. Playfields for two elementary and one junior high school are also located within the City's urban separator.

Multifamily and senior housing complexes are interspersed among the single-family neighborhoods and are generally located along the arterial roadways (i.e., McDowell Boulevard, East Washington Street, and Sonoma Mountain Parkway). One neighborhood-serving commercial center is located along Sonoma Mountain Parkway.

Recreational uses within the North East subarea include Prince Park and Rooster Run Golf Course. Public and institutional uses include the Santa Rosa Junior College, Petaluma Valley Hospital, Lucchesi Park and Community Center, Kenilworth Junior High and various elementary school sites. Santa Rosa Junior College is expanding its facilities, which will double its student capacity.

North McDowell Boulevard

Commercial and industrial uses dominate the 513 acres of the North McDowell Boulevard subarea. Highway commercial uses – such as hotels, restaurants, retail stores, and auto service stations – are located adjacent to the Highway 101/Old Redwood Highway interchange. Business park complexes – featuring "Telecom Valley" office and light industrial uses – are clustered along

Old Redwood Highway and McDowell Boulevard. These one- to four-story structures feature surface parking areas and landscaping.

The North McDowell Boulevard subarea contains a significant portion of the City's senior housing. South of Corona Road, several mobile home parks are located between Highway 101 and McDowell Boulevard, providing affordable living for Petaluma's seniors. Affordable housing projects, multifamily apartments, and townhomes have also been constructed along the southern end of the subarea.

Payran-McKinley

The 247-acre Payran-McKinely subarea consists primarily of residential uses and vacant parcels. It features a diverse range of housing densities for local residents, with single family dwellings, townhomes, apartments, and senior housing options. Single family parcels near Washington Street have been intensified with additional second units to the rear of the properties.

A few active agricultural processing and industrial uses are located between the River and the railroad tracks, including a Clover Stornetta Farms creamery. Large parcels of vacant land occupy the remaining land between the highway, railroad tracks, and Lynch Creek.

Petaluma Boulevard North

Commercial and industrial uses on the eastern side of Petaluma Boulevard North, and rural residential developments on the western side, characterize the 704 acres of this subarea. In addition to the retail commercial uses along the Boulevard, auto-oriented sales and business park uses stretch south from the Highway 101 interchange. Some of the dominant regional retail centers in Petaluma—the Auto Mall and the Factory Outlet Village—are located between Petaluma Boulevard and Highway 101.

Rural residential uses are located on the foothills on the western edge of Petaluma Boulevard North and senior housing is located in a mobile home park near the Highway 101 interchange. Open space consists of agriculturally designated land adjacent to a KOA campground, an actively farmed 20-acre parcel (the pumpkin patch/corn maze), and a driving range beyond the freeway interchange in the northern section of this subarea.

Vacant land lies primarily on the east side of Petaluma Boulevard. A significant portion of commercially zoned lots that are located between the Boulevard and Highway 101 have remained undeveloped due to flooding constraints in the area. The City has acquired four of the vacant parcels along Industrial Avenue, east of Petaluma Boulevard and constructed a flood terrace and habitat restoration.

Petaluma Boulevard South

Heavy industry comprises the major land use in the small, 123-acre Petaluma Boulevard South subarea. Proximity to the River and Highway 101 make this an ideal corridor for this type of use. Very low building intensities on industrial sites accommodate storage and working yards rather than building area. Established roofing, materials, and shipping industries between Petaluma Boulevard and the River are very active. A large materials quarry located adjacent to Highway 101 is undergoing reclamation and has been approved for residential development.

Several single family residences are located on the west side of Petaluma Boulevard South. These single family homes occupy large lots and serve as a buffer between the industry along the riverfront and higher density residential districts in the neighboring West subarea. A family homeless shelter is also located within the Petaluma Boulevard South subarea, between the Boulevard and rural residential uses.

Vacant land that could be developed for either residential or industrial uses comprises another significant portion of acreage in the subarea and is mostly located west of Highway 101 along the River.

South East

Comprising 1,613 acres, the South East subarea is similar in scale and character to the North East. South East consists primarily of single family residences with an overall residential density (6.9 units per net acre) that matches the North East subarea. Together, the North East and the South East subareas are home to a majority of Petaluma's population. The age, design, and scale of the homes changes slightly with distance from Highway 101: single-story homes with garages facing grid street networks transition to larger two-story homes on cul-de-sacs with creek trails. Multifamily complexes are interspersed throughout the South East, generally along arterial roadways.

The Petaluma Municipal Airport, which lies near the eastern edge of the UGB, contributes to the large amount of public land located in this subarea. Open spaces include the Adobe Creek Golf and Country Club and the urban separator between the Airport and nearby residential neighborhoods. Casa Grande High School and other small school sites also contribute to the public land supply, and offer playing fields for recreation.

Relatively little vacant land exists in this subarea. One large vacant parcel east of the Rooster Run Golf Course, at the city's edge, is currently slated for recreation uses.

South Hills

The 277 acres of the South Hills subarea contains large single family residential lots set within the foothills. These homes are generally rural in nature, with long winding driveways and hillside property beyond the building footprints. Most homes are on lots five acres or larger in size.

Open space consists mainly of the privately owned Petaluma Golf and Country Club, with scattered vacant lots that are zoned for residential uses accounting for the remaining open space acreage.

Washington Core

The 308-acre Washington Core subarea is composed of a diverse mix of land uses, with commercial as the dominant use. Two shopping centers occupy opposing corners of the East Washington Street and McDowell Boulevard intersection. These commercial centers provide both neighborhood and regional retail uses for City residents. Commercial uses, mixed-density residential neighborhoods, the Sonoma-Marin Fairgrounds, and several schools constitute the remainder of the Washington Core subarea, between Lakeville Street and Highway 101. Small commercial lots line East Washington Street between Downtown and Highway 101. These parcels

contain retail stores and services, restaurants, and offices; some smaller businesses are housed in converted residences. Limited commercial and light industrial uses are located close to the intersection of Highway 101 and Lakeville Street at the south end of the subarea.

The Sonoma-Marin Fairgrounds occupy the largest single parcel—approximately 64 acres in size—in this area. The Fairgrounds host a variety of special events throughout the year, including the annual Sonoma-Marin Fair in late June.

The Kenilworth Junior High School was recently relocated to a new site in the North East subarea. The City is considering a reuse of this site that would include a mix of housing, commercial, and office space.

Residential neighborhoods are located adjacent to East Washington Street, south of the Fairgrounds area. In these residential neighborhoods, Payran-McKinley, single family lots have been converted with second and third units to create the second highest average housing densities in the City (10.7 units per acre).

West

Comprising 1,934 acres, West – the largest and oldest subarea – includes all of Downtown west of Petaluma Boulevard, adjacent commercial uses, residential neighborhoods, schools, parks, and open space. Commercial and office uses within Downtown are housed in historic structures constructed at a pedestrian scale. Additional commercial development along the Petaluma Boulevard corridor provides neighborhood shopping, service commercial, and hotel/motel uses. Several mixed use parcels are located adjacent to Payran Street. Residential development is buffered from heavy industrial activities along the Petaluma River by small commercial establishments on the west side of Petaluma Boulevard.

Older residential neighborhoods with historic architectural features are located adjacent to Downtown. Established neighborhoods farther from the city's core feature housing that is less dense. Large-lot single family neighborhoods, featuring cul-de-sac streets, abut rolling hills to the west. The overall density for the area is lower than those exhibited by the North East and South East subareas for similar uses.

This subarea also features Helen Putnam County Park, a large recreational open space accessible by foot and equestrian trails. Other important public uses include Petaluma Junior High and High Schools, three elementary schools, City Hall, and the School Administration Center.

West Hills

West Hills contains approximately 248 acres of vacant land, which accounts for the majority of the land uses in this 411-acre subarea. The southern portion of West Hills is made up almost entirely of vacant, undeveloped lands with rolling, grassy hills that contribute to the area's rural quality. Lands along Kelly Creek are planned for future preservation as a park site and walking trail.

The northern section of West Hills features single family housing on large lots interspersed with a significant proportion of open land. One multifamily housing development at El Rose Drive currently contributes a quarter of the housing units in the area.

Eight acres of strip commercial and office uses lie near the intersection of Bodega Avenue and Paula Lane. These uses provide convenience retail for surrounding residential uses.

Agricultural Resources

The California Department of Conservation classifies soils based on their agricultural potential, with the following agricultural classifications found within the Petaluma UGB:

> Farmland of Local Importance. Land of importance to the local economy, as defined by each county's local advisory committee and adopted by its Board of Supervisors.
>
> Grazing Land. Land on which the existing vegetation is suited to the grazing of livestock.
>
> Other Land. Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Within the UGB, the Department of Conservation has designated approximately 316 acres of Farmland of Local Importance, the majority of which is located in the northern, central, and southern sections of the UGB, with some Farmland of Local Importance located along the eastern and western borders of the UGB.[2] The vast majority of land within the Planning Referral Area that is classified as agricultural by the Department of Conservation comprises Grazing Lands, Farmland of Local Importance, and some Prime Farmland.

Vacant Land

Approximately 836 acres of land within the UGB are currently vacant. The West Hills contains the largest proportion of vacant land, located at the edge of the UGB. Petaluma Boulevard North contains nearly 15 percent of the city's vacant land supply, due primarily to development constraints such as flooding. Twelve percent of the vacant land supply is also located in the Central Petaluma Specific Plan area and is being considered for mixed-use development. Over 15 percent of vacant land is located in the city's industrial and business park areas, such as the Lakeville Highway subarea.

Residential Development and Density

Petaluma contains 21,944 (2005) housing units on 3,786 residential acres. Single-family residences constitute approximately 81 percent of total housing units, while multifamily dwellings comprise approximately 12 percent. Senior housing, generally consisting of mobile homes and apartment complexes, comprises 7 percent of the city's housing stock.

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2. California Department of Conservation, Farmlands Mapping and Monitoring Program, 2002.

Citywide, Petaluma maintains an average residential density of 5.6 housing units per net acre (that is, exclusive of streets and other rights-of-way). Petaluma's single-family homes average 5.0 units per acre, multifamily housing averages 16.3 units per acre, and senior housing averages 10.9 units per acre.

The vast majority of the city's housing stock is contained in three subareas – North East, South East, and West. Overall residential densities in the North East and South East average 6.9 units per net acre, while West averages 5.5 units per net acre. In comparison, the rural and hillside residences located within the West Hills, South Hills and Petaluma Boulevard North subareas have substantially larger average lot sizes and lower densities.

Non-Residential Development and Building Intensity

The city contains 10.16 million square feet of commercial building area. A majority of this consists of office uses, much of it focused in the Lakeville Highway and North McDowell Boulevard business parks. Strip commercial and shopping center uses—which generally include retail stores, personal and business services, and restaurants—together comprise 40 percent of commercial uses.

Industrial uses comprise approximately 5.29 million square feet of building space within Petaluma. Light industrial activity is focused within the Lakeville Highway and North McDowell business parks. Nearly one million square feet of warehouse space—18 percent of the city's industrial square footage—is contained within the Lakeville Highway and North McDowell Boulevard subareas. The majority of the city's 1.16 million square feet of heavy industry is located within four subareas accessible by river and/or highway transportation: Central Petaluma Specific Plan, Lakeville Highway, North McDowell, and Washington Core.

Non-residential building intensity is assessed by Floor Area Ratio (FAR), which is a broad measure of building bulk that affects visual prominence.[3] FARs average approximately 0.27 throughout Petaluma's non-residential areas. The citywide FAR for commercial development averages 0.32, which is representative of single-story commercial development with surface parking. Industrial uses average 0.21 FAR, which results from the horizontal development style of business parks, as well as heavy industry with large working and storage yards.

The highest FARs in Petaluma occur in the Lakeville Highway subarea, due to office development within business parks. High commercial FARs in Downtown stem from retail and restaurant development, with structured and/or on-street parking.

REGULATORY SETTING

Current City plans guiding land use within Petaluma are its General Plan (adopted 1987) and the Central Petaluma Specific Plan (2003). These plans provide visions for land use development in

3. Floor Area Ratio (FAR) is calculated by dividing total building square footage by total lot square footage.

Petaluma and suggest public regulations, actions, and capital improvements. Plans by several outside agencies have jurisdiction over some land in Petaluma, while the development of land in unincorporated Sonoma County within the Petaluma Sphere of Influence is guided by the County General Plan. The adjacent cities of Rohnert Park, Cotati, and Novato also have their own general plans. These plans are summarized below.

Current Land Use Plans

Petaluma General Plan

The City's current General Plan was adopted in March 1987. The Plan includes nine elements: Community Character; Land Use and Growth Management; The River; Open Space, Conservation, and Energy; Parks, Recreation, Schools, and Child Care; Local Economy; Housing; Transportation; and Community Health and Safety. The Plan provides a land use framework for the pattern of development within city limits. The primary land use designation under the current General Plan is low-density residential intended for single-family homes. Higher density residential uses are primarily concentrated along major arterial roads, including Petaluma Boulevard South and Highway 101. The principal employment-generating uses are located in Downtown and in northern Petaluma as well as in the industrial business parks located off Lakeville Highway and North McDowell Boulevard.

The proposed General Plan will replace eight elements of the existing General Plan with the following elements: Land Use, Growth Management and the Built Environment; Community Design, Character and Sustainable Building; Mobility; Community Facilities and Services; Water Resources; Economic Health and Sustainability; Recreation, Music, Parks, and the Arts; the Natural Environment; and Health and Safety. The proposed General Plan would not contain a separate River Element. Instead policies of the River Element from the 1987 General Plan that are still applicable, as well as new policies concerning the Petaluma River, would be encompassed in other elements of the proposed General Plan such as the Land Use, Growth Management, and the Built Environment Element; Recreation, Music, Parks, and the Arts Element and the Natural Environment Element. The Housing Element was updated in December 2002 and would be incorporated as is into the proposed General Plan.

Central Petaluma Specific Plan

Adopted in June 2003, the overarching goal of the CPSP is to reinvigorate the central district and accommodate a greater diversity and intensity of activities, including the continuation of traditional industries and older residential areas that give the area identity and interest, as well as new environments for living and working in proximity to the downtown and the river. The CPSP's policies provide for a mixture of new employment, housing, shopping, and entertainment activities developed around downtown, the riverfront warehouse district, and two future transit centers located at the historic Petaluma Depot and on Caulfield Lane. This specific plan will continue to be the guiding policy document for the area under the proposed new General Plan. The Development Code will ensure that new land uses in this neighborhood, including offices and multifamily residences, are compatible with existing uses.

Plans from Surrounding Jurisdictions and Other Agencies

Williamson Act

The Williamson Act of 1965 (California Land Conservation Act, Government Code §51200 et seq.) is intended to discourage the unnecessary and premature conversion of agricultural land to non-agricultural uses by taxing land according to the income-producing value, rather than its "highest and best use." Under contract, farmers agree not to develop their land for 10 years in exchange for the lower tax rate; contracts are automatically renewed each year. Land under a Williamson Act contract is designated as an agricultural preserve, which can be used for agriculture, recreational uses, open space and managed habitat, or scenic highway corridor. There are no agricultural preserves in the UGB.

Sonoma County Agricultural Preservation and Open Space District

The Sonoma County Agricultural Preservation and Open Space District (SCAPOSD) *Acquisition Plan 2000* addresses acquisition and preservation of open space resources within Sonoma County. The Agricultural Preservation and Open Space District is a dependent Special District formed under Government Code Section 6552 and Section 5500 et seq. of the California Public Resources Code. The intent of the District is to further State policy on the preservation of open space and to implement the Open Space and Agricultural Resources Element of the 1989 Sonoma County General Plan. Four types of open spaces are addressed by the Acquisition Plan:

> Agriculture includes farms, dairies, livestock ranches, vineyards and other agricultural lands that contribute to the County's agricultural economy. Small parcels of greenbelt agriculture are designated outside of the City's UGB on the northwest and southwest.
>
> Greenbelts include community separators, areas around and between communities that contribute to the open space character of the region. Four greenbelts surround the City: Windsor-Santa Rosa to the north, Sonoma Valley to the east, Taylor Mountain to the south, and Sebastopol-Santa Rosa to the west.
>
> Natural Resources include forestlands, oak woodlands, wetlands, areas containing threatened or endangered species, fish spawning streams, and other areas of biotic significance. Swaths of "priority riparian corridors" and "priority oak woodlands" bisect the eastern portion of the City, and areas north and east of the UGB.
>
> Recreation includes sites with multiple natural resource features suitable for acquisition as parks, preserves, or public access projects. Several SCAPOSD properties offering recreational opportunities are located within the Planning Area.

The Acquisition Plan identifies land surrounding Petaluma for Greenbelt Agriculture; Priority Greenbelt (including community separators and expanded greenbelts), priority riparian corridors; wetland priority areas (where the presence of threatened and endangered species has been identified), and priority recreation areas.

Sonoma County General Plan

The Sonoma County General Plan provides the land use framework for the pattern of development in the unincorporated areas of Sonoma County. The General Plan, which guides decisions on future growth, development and conservation of resources, was adopted in 1989.

The Sonoma County General Plan contains general policies and goals for the unincorporated land in the County and provides policies for nine planning subareas, including Petaluma and its environs. The major objectives set forth by the County General Plan for the Petaluma area include:

> Avoiding extension of Petaluma's urban service boundary and limit urban residential development to the urban service area when annexed by the City;
>
> Making Petaluma the commercial and industrial center for the southwestern Sonoma County area and restricting commercial uses to locations within its urban service area and to existing areas allowed by Specific or Area plans as of 1986;
>
> Limiting recreation and visitor serving uses in rural areas; and
>
> Avoiding commercial and industrial development and residential densities greater than one unit per 60 acres.

The Sonoma County General Plan Land Use Element map for the Petaluma and Environs subarea, which establishes the permitted uses for the unincorporated land in the County, designates the hillsides around Petaluma as Rural Residential, Diverse Agriculture, and Land Extensive Agriculture. The Rural Residential land use designation allows single-family homes with a density range of one to 20 acres per dwelling unit; one acre per unit allowed only if the property is served by the public water system. The Diverse Agriculture land use designation is intended to enhance and protect land areas where soil, climate, and water conditions support farming, but where small-acreage intensive farming and part-time farming activities are predominant. This designation allows the full range of agricultural uses. The Land Extensive Agriculture land use designation is intended to enhance and protect lands capable of the full range of agricultural uses, including the production of food, fiber and plant materials as well as for raising and maintaining livestock. Because land falling under this designation is intended for agricultural use, residential uses are restricted to a density range of 60 to 320 acres per unit.

Sonoma County is currently in the process of updating their General Plan. The County's General Plan update would contain similar policies and land use designations for the Petaluma area as the existing 1987 General Plan. Expanded Water Resource Element policies address the need for regional solutions to surface water issues.

Comprehensive Airport Land Use Plan for Sonoma County

The California Public Utilities Code establishes airport land use commissions in each county to provide for the orderly development of air transportation and ensure compatible land uses around airports. The land use plan adopted by the Sonoma County Airport Land Use Commission in January 2001 sets forth referral boundaries, uses which are prohibited or discouraged, projected noise levels, noise standards, and limits on building height, population density, residential density, and lot coverage. This plan is intended to protect and promote the safety and welfare of residents near the public use airports in Sonoma County, while promoting the continued operation of those airports. Specifically, the plan seeks to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities encroach upon or adversely affect the use of navigable airspace. Implementation of the plan will promote compatible urban development in the vicinity of the public use airports in the County, thus

allowing for the continued operation of those airports. Three areas of compatibility are considered in the Plan:

> Compatibility of surrounding land uses with airport noise levels;
>
> Compatibility of surrounding land uses with respect to the safety of persons on the ground and persons on board aircraft making controlled crash landings;
>
> Protection of airspace needed for safe air navigation near airports.

The Plan applies to six public use airports in Sonoma County: Cloverdale Municipal, Healdsburg Municipal, Petaluma Municipal, Sonoma County, Sonoma Skypark, and Sonoma Valley Airports.

The Petaluma Municipal Airport is located in the South East subarea adjacent to single-family housing to the south and park and recreation land and the City limits to the north and east. The airport is classified in the National Plan of Integrated Airport Systems as a reliever airport for the greater San Francisco Bay area. It is owned and operated by the City of Petaluma. The proposed Petaluma General Plan Land Use Map designates land off both ends of the runway, to the north and the south of the airport, for open spaces. Most of the land to the west and southwest is designated for residential uses. According to State law, a local jurisdiction's General Plan and specific plans must be consistent with the Comprehensive Airport Land Use Plan.

Cotati General Plan

Cotati is located approximately 10 miles to the northeast of Petaluma with Highway 101 providing the main connection between the two cities. Cotati's General Plan was adopted in 1990.[4] The Cotati General Plan focuses on four major areas that reflect the City's desire to preserve its rural environment while continuing to provide the incorporated areas with necessary urban amenities. They also reflect Cotati's desire to remain a distinct and unpretentious small town while accepting the reality of being surrounded by a rapidly growing area. The four major sections of the General Plan include Community Development, Quality of Life, Economic Vitality, and Community Identity. The goals and policies of the Cotati General Plan emphasize the community's focus of maintaining a small town atmosphere, which includes preservation of surrounding agricultural land and open space. Policies include the use of clustered housing and the use of vacant land within the city before considering annexation of new land.

Rohnert Park General Plan

Rohnert Park is located north of Petaluma, adjacent to Cotati, along US Highway 101 and Old Redwood Highway. Rohnert Park adopted its General Plan in July 2002. The major themes of the Rohnert Park General Plan surround maintaining an urban growth boundary and growth management program; maintaining a "Greenbelt" around the City, with targeted growth areas; implementing pedestrian-oriented mixed-use centers in their University District and the City Center; balancing neighborhoods so that residents have easy access to parks, schools, and commercial activity centers; increased connectivity and accessibility by improving connections

4. In June 2005, the City of Cotati began an effort to update their 1990 General Plan.

between neighborhoods and across the highway; creating an interconnected network of open space, parks, and trails; promoting pedestrian and bicycle-friendly environments; and enhancing community character by establishing specific urban design policies.

Rohnert Park anticipates a population increase of approximately 9,400; from approximately 41,000 in 1999 to 50,400 by the General Plan horizon year of 2020. The City also anticipates an increase in employment that would total 31,600 jobs by the year 2020. Rohnert Park's General Plan establishes an Urban Growth Boundary (UGB), the southern boundary of which is approximately 11 miles north of the Petaluma city limit. Most of the development that would occur in order to accommodate the growth in residential and worker populations would happen within Rohnert Park's UGB with development outside of the UGB being restricted to parkland and open space or rural residential uses.

Novato General Plan

Novato is located approximately 11 miles south of Petaluma along Highway 101 in Marin County. The Novato General Plan was adopted in March 1996 and, like Cotati, focuses on retention of their small town character and maintaining a compact city through the implementation of firm urban limit lines. The plan also aims at revitalizing and maintaining Novato's downtown as the heart of the community and managing growth by requiring the coordination of development with adequate infrastructure, public facilities, public services and promoting conservation, reuse and recycling strategies while meeting the needs of the community with the limited land available for development.

IMPACT ANALYSIS

Significance Criteria

The Proposed General Plan would result in significant land use impacts if it would:

Physically divide an established community;

Displace substantial numbers of existing housing or people;

Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project;

Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use;

Conflict with existing zoning for agricultural use or a Williamson Act contract; or

Involve other changes that, due to their location or nature, could result in conversion of farmland.

Changes in land use are not, in and of themselves, environmental impacts. Land use changes are impacts only relative to the prior use of the site (i.e., conversion of open space or farmland, an irreplaceable resource, or displacement of homes) or the surrounding usage and character (i.e., division of an established community).

Methodology & Assumptions

This analysis considered current and proposed General Plan policies and goals, existing and proposed land use conditions within Petaluma, and applicable regulations and guidelines. The use of Geographic Information Systems (GIS) was employed, where appropriate, to quantify potential changes in land use due to the proposed General Plan. For the purposes of comparing the different land use designations between the existing and proposed General Plans, generalized land use categories were used.

Summary of Impacts

The intent of the 2025 General Plan is to create a city in which planned land uses exist and function without imposing a nuisance, hazard, or unhealthy condition upon an adjacent use. Commercial, residential and office uses are compatible if building scale and character are consistent, pedestrian connections are provided, and auto-oriented uses are limited. Uses within areas designated for mixed use development are expected to be compatible with one another because General Plan policies establish requirements for compatible development, including buffering, screening, controls and performance standards. Implementation of the General Plan will create specific regulatory standards and review procedures to ensure compatible land uses.

The proposed General Plan does not physically divide any established community. Rather, by providing better connectivity within the city through improved transportation networks and more pedestrian and bike paths, the Plan provides better linkages within and between existing communities.

Redevelopment caused by new permitted land uses or different densities may remove a very limited amount of housing in certain areas, but overall the proposed plan will increase the number of housing units in Petaluma so anyone displaced will be able to find accommodation in the same area.

The General Plan is based on the premise that growth during the period of 2005-2025 should occur within the present UGB. Because of this, no land currently designated for agricultural use located outside of the UGB would be converted to non-agricultural use under the proposed General Plan. The proposed plan may convert a small amount of farmland located inside the UGB to non-agricultural use; however, the conversion of this land would not be considered a significant impact under CEQA. No Williamson Act contract land would be affected and no other changes would result in the conversion of farmland.

Consistency with Plans and Policies

The proposed 2025 General Plan will be the guiding document in Petaluma. Adopted City policies, plans, programs, and the zoning code, and other implementing tools will be amended to conform to the adopted General Plan. Specifically, the City's Zoning Ordinance and Subdivision Regulations would be updated to comply with the proposed General Plan.

Consistency with Other General Plans

The boundaries of the Planning Referral Area of the proposed General Plan would overlap with Rohnert Park and Cotati's Planning Areas and abuts the northern boundary of Novato's Sphere of Influence. However, the proposed General Plan does not propose any new development on

portions within the Planning Area that overlap with Rohnert Park or Cotati's Planning Areas and no development is proposed adjacent to Novato's Sphere of Influence. Development under the proposed General Plan would be confined within the UGB. In addition, the proposed General Plan would contain policies encouraging that land surrounding the city be maintained as undeveloped or developed at rural intensities. Therefore, the proposed General Plan would not conflict with the policies or land use designations of the nearby cities of Rohnert Park, Cotati, and Novato.

For land within the UGB, but outside of the city limits, the proposed General Plan largely proposes Rural Residential (0.1-0.5 housing units per acre) and Very Low Density Residential (0.6-2.0 housing units per acre). These land uses are consistent with those identified by the County for the same areas. The proposed General Plan would not contain any policies or provisions that would conflict with the Sonoma County General Plan or the goals of the Sonoma County Agricultural Preservation and Open Space District.

Consistency with Comprehensive Airport Land Use Plan

The proposed General Plan includes a new city park and single-family residential uses within one mile of the Petaluma Municipal Airport. The Comprehensive Airport Land Use Plan for Sonoma County establishes airport noise/land use compatibility standards for land uses within proximity to the airport based on Community Noise Equivalent Levels (CNEL). The city park designation, which would be located immediately to the east of the airport, would be a land use compatible with all noise standards. However, Policy 8.3.1.1 of the Comprehensive Airport Land Use Plan states that "the maximum CNEL considered normally acceptable for residential uses...in the vicinity of airports covered by this Plan is 55 CNEL." The proposed single-family land use designation that is proposed to the northwest of the airport is within an area experiencing between 55 and 60 CNEL, dBA as established by the Airport Land Use Plan. Therefore, any residential uses constructed in this area would be required under the Comprehensive Airport Land Use Plan to meet certain compatibility criteria, including implementing measures that would reduce noise levels by at least 25 decibels.

The Airport Land Use Plan also establishes Airport Safety Zones. The proposed single-family residential designation and the proposed city park designation are within the Inner Turning Zone and the Sideline Safety Zone, respectively. Neither of the proposed uses conflict with the allowable land uses or densities allowed in these zones, as established by Table 8B of the Airport Land Use Plan.

As outlined in Impact 3.1-2 below, the proposed General Plan contains policies to ensure that airport noise affecting nearby residential uses would be minimized and that land uses in the airport area should be compatible with the Comprehensive Airport Land Use Plan for Sonoma County.

Impacts and Mitigation Measures

Impact 3.1-1 The proposed General Plan may result in the conversion of some farmland to non-agricultural uses. (Less than Significant)

Under the proposed General Plan, approximately 316 acres of land located throughout the UGB that is designated as Farmland of Local Importance by the California Department of

Conservation would be designated for non-agricultural use, which would eliminate most land designated as Farmland of Local Importance within the UGB—three parcels in the northern section of the city would maintain their agricultural designation. The majority of Farmland of Local Importance that is within the UBG is currently vacant with only a small portion currently being used for agricultural purposes. The conversion of farmland that would occur under the proposed General Plan would not constitute a significant loss of farmland, nor does CEQA consider the conversion of Farmland of Local Importance to be a significant impact. In addition, the proposed General Plan would not involve the conversion of any Prime Farmland to non-agricultural uses. Moreover, the General Plan Land Use Element contains policies that ensure the maintenance and preservation of farmland outside of the UGB.

Proposed General Plan Policies that Reduce the Impact

2-P-1 Promote a range of land uses at densities and intensities to serve the community needs within the Urban Growth Boundary (UGB).

A. Update the city's Development Code for consistency with the General Plan, including:

Establishment of new base districts, consistent with the land use classifications in the General Plan.

Continue the identification of overlay districts, such as the Floodplain and Historic Districts.

Creation of the Petaluma River Corridor.

Maintain both minimum and maximum development intensities as stipulated in the General Plan Land Use Classifications.

Opportunities for infill without land division.

Design Guidelines, where applicable.

2-P-2 Use land efficiently by promoting infill development, at equal or higher density and intensity than surrounding uses.

2-P-16 Maintain a permanent open space around the city by the continuation of the Urban Separator and the use of an Urban Separator Pathway, where appropriate.

2-P-23 Support designation of land uses in the unincorporated area beyond the Urban Growth Boundary as rural, agricultural and/or open space.

A. Work with local, state and federal funding sources to acquire open space outside of the Urban Separator and/or beyond the Urban Growth Boundary where community-wide benefit is achieved.

2-P-25 It is the policy of the City to build within the agreed upon Urban Growth Boundary. No urban development shall be permitted beyond the Urban Growth Boundary. "Urban development" shall mean development requiring one or more basic municipal services including, but no limited to, water service, sewer, improved storm

drainage facilities, fire hydrants and other physical public facilities and services, but shall not mean providing municipal or public services to open space uses, public or quasi-public uses such as schools or public safety facilities. Said municipal or public services or facilities can be developed beyond the UGB to provide services within the UGB.

A. Maintain a time certain and parcel-specific Urban Growth Boundary around the city, beyond which urban development will not take place.

B. Use the growth management system, design review, or other project review methods to assure that the density of new residential development is greatest within and adjoining existing urbanized areas and gradually and logically lessens as it approaches the urban edge.

C. Encourage the County to continue to promote agricultural land use and to strictly limit further residential infilling on lands beyond the Urban Growth Boundary within the Petaluma Planning Referral Area.

Mitigation Measures

No mitigation measures are required.

3.2 TRANSPORTATION

This section of the EIR evaluates potential transportation impacts resulting from implementation of the proposed Petaluma General Plan 2025. Impacts are evaluated based upon a comparison between existing conditions and future conditions (year 2025) with the proposed project.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

The circulation network serving Petaluma consists of roadways, transit, bicycle and pedestrian facilities. A description of travel characteristics, major transportation facilities and existing travel conditions is provided in the Petaluma General Plan 2025: Existing Conditions, Opportunities and Challenges Report; a summary of those key travel characteristics is included in this section.

Travel Characteristics

Journey to work data gathered by the U.S. Census Bureau provides a means of estimating the prevalence of particular transportation modes, or mode split, in a given community. Based on the 2000 U.S. Census, the majority of Petaluma's employed residents commute to work outside of the City[1] and travel by single-occupancy private automobile. As shown by Table 3.2-1, just over 72 percent of Petaluma's residents drove alone to work in 2000, a slight decrease since 1990. Fourteen (14) percent of residents carpooled to work and five percent used transit (up from 4.2 percent in 1990). The percent of people employed at home more than doubled between 1990 and 2000, to 4.7 percent, while 2.6 percent walked to work and 0.9 percent bicycled to work.

Table 3.2-1: Journey to Work by Mode of Travel, Petaluma Residents

Mode	*2000 Census*	*1990 Census*
Drive alone	72.1 %	74.1 %
Carpool	13.8 %	15.3 %
Transit	5.0 %	4.2 %
Walk	2.6 %	2.6 %
Worked at home	4.7 %	2.2 %
Bicycle	0.9 %	1.1 %
Motorcycle	0.2 %	0.3 %
Other	0.7 %	0.3 %

Source: U.S. Census

Motor Vehicle Circulation

U.S. 101 serves as the primary route between San Francisco and Marin and Sonoma Counties, providing regional access to Petaluma. Over 90,000 vehicles per day travel on U.S. 101 within Petaluma.

1. Thirty-eight (38) percent of Petaluma's working residents are employed in Petaluma, 18 percent are employed elsewhere in Sonoma County, and 43 percent work outside of Sonoma County.

The Petaluma street system is composed of approximately 140 miles of streets. In many locations, the Petaluma River and U.S. 101 create barriers to east-west circulation. Streets with the highest average daily traffic (ADT) are those that provide east/west connections across the river or freeway, or provide access to U.S. 101 or serve as a parallel route to the freeway. These streets include:

East Washington Street, a major east/west connector providing access to U.S. 101 and westward to the coast;

Lakeville Highway (State Route 116), another major east west/connector providing access to U.S. 101 and Highway 37;

McDowell Boulevard, a parallel route to U.S. 101;

Petaluma Boulevard, a parallel route to U.S. 101 on the West Side that serves Downtown Petaluma;

Old Redwood Highway, that is a continuation of Petaluma Boulevard, at the north end of town after crossing U.S. 101, often used as an alternate route to the highway; and

D Street, an east-west street providing crossings of the Petaluma River and Northwest Pacific Railroad tracks, as well as providing access to west county areas.

Level of Service

Level of Service (LOS) is a qualitative assessment of perceived traffic conditions by motorists. LOS generally reflects driving conditions such as travel time and speed, freedom to maneuver, and traffic interruptions. LOS uses quantifiable traffic measures such as average speed, intersection control delay, and volume-to-capacity ratio to determine driver satisfaction. LOS is reported for individual intersections and is designated by a range of letters – "A" represents the most favorable conditions (free flow) and "F" represents the least favorable conditions (jammed with excessive delays). Table 3.2-2 describes the characteristics of each LOS designation. For purposes of this EIR, intersection and freeway segment LOS was analyzed. A comparison of volumes on roadway segments is included in the alternatives analysis.

Since automobile travel has been the dominant form of transportation, level of service has traditionally been measured for vehicles, with minimal regard to bicycle, pedestrian, and transit conditions. This bias unintentionally but inherently ignores overall mobility and conditions for non-auto road users and perpetuates a system that focuses on expanding auto capacity. A key goal of the proposed Petaluma General Plan 2025 is to ensure the accommodation of multiple travel modes on the existing street network. In order to accomplish this goal, it may be necessary to resist implementing vehicle capacity expansions in key areas where pedestrian conditions would suffer from additional traffic lanes; Petaluma Boulevard in the downtown area is the most notable example.

The 1987 General Plan established LOS C as the desired standard for travel during the A.M. and P.M. peak hours. Adoption of the proposed Petaluma General Plan 2025 would establish a revised standard of LOS D. Even with the revised standard, there still may be instances when it is not possible to meet the desired LOS without negatively impacting other travel modes. Therefore, it may be necessary to consider adoption of a mechanism to allow certain locations to exceed the LOS standard if multi-modal improvements are installed as an alternative to roadway capacity expansion; development of such a mechanism is outside the scope of this document.

Intersections

Signalized intersection traffic conditions and resulting LOS are determined using the Transportation Research Board's Highway Capacity Manual (HCM) – Special Report 209, (Chapter 16) methodology. This operations analysis uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the control delay per vehicle. Control delay is the portion of the total delay attributed to signal operations and includes initial deceleration, queue move up time, stopped delay, and acceleration delay. Using this methodology, the LOS for a signalized intersection is based on the control delay per vehicle measured in seconds. Table 3.2-3 summarizes the relationship between delay and LOS.

All-way stop-controlled and side-street stop-controlled intersections are evaluated using the HCM – Special Report 209 (Chapter 17) methodologies. Operations are defined by the average control delay per vehicle (measured in seconds) for each stop-controlled movement. This incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For side-street stop-controlled intersections, the delay reported in this study is represented for the worst-case minor approach. For all-way stop-controlled intersections the level of service is represented by the average control delay for the whole intersection.

Freeway Segments

Freeway segments on U.S. 101 are analyzed using volume-to-capacity (V/C) ratios. The capacities of the study freeway facilities were obtained from the HCM. According to the HCM, for a freeway segment with minimum 12-foot travel lane widths, 6-foot shoulder widths, 2-foot median lateral clearance, a traffic stream composed entirely of passenger cars, interchange spacing greater than two miles, level terrain, and a driver population composed principally of regular users, the ideal freeway capacity is 2,400 vehicles per hour per lane. However, segments of U.S. 101 through Petaluma have many features that reduce the capacity flow rates from the ideal of 2,400 vehicles per hour per lane, including:

Heavy vehicles, including trucks, buses, and recreational vehicles, represent approximately five percent of vehicles on U.S. 101;

Locations with short merge distances for on-ramps; and

Interchange spacing typically less than two miles.

Therefore, the capacity of 2,200 vehicles per hour per lane was selected as an appropriate approximation of freeway capacity through Petaluma. This capacity is a commonly used estimate of freeway capacity and is consistent with previous analyses performed in Petaluma. Table 3.2-4 summarizes the relationship between V/C and LOS for freeway segments.

Table 3.2-2: Qualitative Description of Level of Service

Level of Service	*Driver's Perception*
A / B	LOS A / B are characterized by light congestion. Motorists are generally able to maintain desired speeds on two and four lane roads and make lane changes on four lane roads. Motorists are still able to pass through traffic-controlled intersections in one green phase. Stop-controlled approach motorists begin to notice absence of available gaps.
C	LOS C represents moderate traffic congestion. Average vehicle speeds continue to be near the motorist's desired speed for two and four lane roads. Lane change maneuvers on four lane roads increase to maintain desired speed. Turning traffic and slow vehicles begin to have an adverse impact on traffic flows. Occasionally, motorists do not clear the intersection on the first green phase.
D	LOS D is characterized by congestion with average vehicle speeds decreasing below the motorist's desired level for two and four lane roads. Lane change maneuvers on four lane roads are difficult to make and adversely affect traffic flow like turning traffic and slow vehicles. Multiple cars must wait through more than one green phase at a traffic signal. Stop-controlled approach motorists experience queuing due to a reduction in available gaps.
E	LOS E is the lowest grade possible without stop-and-go operations. Driving speeds are substantially reduced and brief periods of stop-and-go conditions can occur on two and four lane roads and lane changes are minimal. At signalized intersections, long vehicle queues can form waiting to be served by the signal's green phase. Insufficient gaps on the major streets cause extensive queuing on the stop-controlled approaches.
F	LOS F represents stop-and-go conditions for two and four lane roads. Traffic flow is constrained and lane changes minimal. Drivers at signalized intersections may wait several green phases prior to being served. Motorists on stop-controlled approaches experience insufficient gaps of suitable size to cross safely through a major traffic stream.

Source: Fehr & Peers and 2000 Highway Capacity Manual

Table 3.2-3 Intersection Level of Service Criteria

Level of Service	*Signalized Intersection Control Delay per Vehicle (Seconds)*	*Stop-controlled Intersection Control Delay per Vehicle (Seconds)*
A	≤ 10.0	≤ 10.0
B	>10.0 and ≤ 20.0	>10.0 and ≤ 15.0
C	>20.0 and ≤ 35.0	>15.0 and ≤ 25.0
D	>35.0 and ≤ 55.0	>25.0 and ≤ 35.0
E	>55.0 and ≤ 80.0	>35.0 and ≤ 50.0
F	>80.0	>50.0

Source: 2000 Highway Capacity Manual

Table 3.2-4 Freeway Segment Level of Service Definitions

Level of Service	*Traffic Conditions*	*Upper V / C Threshold*
A	Little or no congestion	0.60
B	Small amount of traffic congestion	0.70
C	Average traffic congestion	0.80
D	High traffic congestion	0.90
E	Very high traffic congestion	1.00
F	Oversaturated, stop-and-go conditions	>1.00

Source: 2000 Highway Capacity Manual

Existing Intersection Operations

LOS was measured at 46 study intersections in Petaluma, shown in Figure 3.2-1. These intersections were chosen as those most likely to be potentially impacted by future development, based on a review of intersections evaluated in previous traffic studies in Petaluma. Existing lane geometries are shown in Figure 3.2-5 (see the end of this section). Fehr & Peers collected vehicle counts at each study intersection during the morning and evening peak commute hours (7-9 AM and 4-6 PM) on varying dates. Existing traffic volumes are shown in Figure 3.2-6 (see the end of this section). This data was used to determine the peak LOS rating, or hour when the highest number of vehicles passed through the intersection during each commute period. Table 3.2-5 lists each study intersection along with the AM and PM peak level of service for existing conditions.

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Insert Figure 3.2-1: Map of Study Intersections

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Table 3.2-5 Intersection Level of Service, Existing Conditions

		LOS[3]/Delay (Seconds/Vehicle)[2]	
		Existing Conditions	
Intersection	*Control[1]*	*AM Peak Hour*	*PM Peak Hour*
1. Old Redwood Highway / McDowell Boulevard Extension	Signal	A / 6.3	B / 14.8
2. Old Redwood Highway / Redwood Way	Signal	B / 10.1	B / 17.6
3. Old Redwood Highway / McDowell Boulevard	Signal	C / 27.3	D / 46.3
4. Petaluma Boulevard N. / Stony Point Rd / Industrial Ave	Signal	C / 28.5	C / 27.1
5. Petaluma Blvd N. / Corona Rd	Signal	D / 38.5	D / 38.2
6. Petaluma Boulevard N. / Factory Outlets / Oak Lane	Signal	B / 12.0	B / 12.5
7. Sonoma Mountain Parkway / Corona Rd	Signal**	B / 10.8	B / 13.1
8. McDowell Boulevard N. / Corona Rd	Signal	C / 33.5	C / 30.5
9. Sonoma Mountain Parkway / Ely Road	Signal	B / 14.7	B / 16.6
10. Sonoma Mountain Parkway / Rainier Circle / Rainier Avenue	Signal	B / 15.2	B / 13.6
11. Sonoma Mountain Parkway / East Washington Street	Signal	C / 30.4	D / 42.8
12. Maria Drive / East Washington Street	Signal	B / 17.5	C / 28.8
13. McDowell Boulevard N. / Rainier Avenue	Signal	A / 9.6	B / 11.4
14. McDowell Boulevard N. / Lynch Creek Drive	Signal	B / 12.2	B / 13.8
15. McDowell Boulevard / East Madison Street	Signal	B / 14.5	B / 18.2
16. McDowell Boulevard/ East Washington Street	Signal	C / 31.2	D / 48.0
17. S. McDowell Boulevard/Caulfield Lane	Signal	B / 13.8	B / 13.1
18. East Washington Street / Ellis Street / Kenilworth Drive	Signal	C / 29.3	C / 20.1
19. Caulfield Lane / Payran Street	Signal	B / 14.3	C / 22.2
20. Lakeville Street / Caulfield Lane	Signal	B / 18.5	C / 22.6
21. East Washington Street / Lakeville Street	Signal	B / 21.2	C / 24.5
22. Lakeville Street / D Street	Signal	C / 26.4	C / 32.4
23. Petaluma Boulevard S. / I Street	Signal	C / 28.0	B / 12.0
24. Petaluma Boulevard S. / Mountain View Ave	Signal	B / 11.8	A / 9.2
25. Petaluma Boulevard S. / McNear Avenue	Signal	A / 8.2	A / 7.5
26. Petaluma Boulevard N. / Shasta Avenue	Signal	A / 8.8	A / 8.9
27. Petaluma Boulevard N. / Payran Street / Magnolia Avenue	Signal	C / 24.9	D / 37.9
28. Petaluma Boulevard N. / Lakeville Street	Signal	B / 17.1	C / 31.3
29. Petaluma Boulevard N. / Washington Street	Signal	C / 29.9	D / 36.9
30. Washington Street / Bodega Avenue / Howard Street	Signal	B / 19.6	C / 20.6
31. Washington Street / Bodega Avenue/Webster Street	Signal	A / 6.9	A / 6.9
32. Western Avenue / Kentucky Street	Signal	A / 5.0	A / 7.1
33. Petaluma Boulevard / B Street	Signal	A / 6.8	A / 6.2

Table 3.2-5 Intersection Level of Service, Existing Conditions

		LOS[3]/Delay (Seconds/Vehicle)[2]	
		Existing Conditions	
Intersection	*Control[1]*	*AM Peak Hour*	*PM Peak Hour*
34. Petaluma Boulevard S. / D Street	Signal	C / 30.5	E / 57.1
35. Old Redwood Highway / NB Ramps	Signal	B / 19.1	B / 13.6
36. Old Redwood Highway / SB Ramps	Signal	C / 25.7	B / 16.0
37. East Washington Street / NB Ramps	Signal	B / 18.8	C / 21.3
38. East Washington Street / U.S. 101 SB Ramps	Signal	D / 37.5	C / 28.1
39. Lakeville Street / Lindberg Lane	SSSC	B / 14.3	C / 20.4
40. Lakeville Street / NB Ramps	Signal	A / 9.2	A / 9.9
41. Lakeville Street / SB Ramps	Signal	C / 22.6	B / 15.3
42. Lakeville Highway / Baywood Drive	Signal	D / 37.9	C / 33.8
43. Petaluma Boulevard South / SB Ramps	SSSC	B / 11.6	C / 15.2
44. Rainier Extension / NB Ramps	N.A.	N.A.	N.A.
45. Rainier Extension / SB Ramps	N.A.	N.A.	N.A.
46. Payran Street / East Washington Street	Signal	C / 29.9	C / 28.5

Note: Bold indicates unacceptable operations (LOS D or worse based on City's current LOS criteria).

1 Signal = Signalized intersection; SSSC = Side Street Stop Controlled Intersection
2 Delay in seconds calculated using the 2000 Highway Capacity Manual. Worst approach reported for SSSC intersections
3 LOS = Level of Service
* Intersection likely affected by queues from neighboring intersections and LOS could be worse
**Roundabout was installed at Corona Road/Sonoma Mountain Parkway intersection after data was collected; existing conditions data reflects LOS with signal.

Source: Fehr & Peers Associates, 2006

The majority of intersections operate at LOS C or better during the AM and PM peak hours. Nine (9) intersections operate at LOS D or worse during either peak hour (approaching capacity):

Petaluma Boulevard N. / Corona Road

Petaluma Boulevard N. / Payran Street-Magnolia Avenue

Petaluma Boulevard N. / Washington Street

Petaluma Boulevard S. / D Street

East Washington Street / Sonoma Mountain Parkway

East Washington Street/ McDowell Boulevard

East Washington Street / U.S. 101 Southbound Ramps

McDowell Boulevard N. / Old Redwood Highway

Lakeville Highway / Baywood Drive

Existing Freeway Operations

U.S. 101 currently has two mixed-flow travel lanes in each direction. Existing traffic volumes were obtained from Caltrans' published freeway volumes for year 2003. According to the data, the worst-case condition for freeway segments in this area is the PM peak hour (based upon the prevalence of northbound traffic during this time; Caltrans data does not specify the precise hours in which this occurs). Using the peak-hour volumes obtained from Caltrans and theoretical freeway peak-hour capacities, the V/C ratio for each segment was calculated by dividing the actual traffic volumes by the theoretical capacity. This ratio was used to calculate the segment LOS.

The existing conditions freeway volumes as well as the theoretical capacity of each segment, the resulting V/C ratio, and the resulting LOS are depicted in Table 3.2-6. As shown, northbound U.S. 101 experiences congestion throughout Petaluma during the peak hour, while southbound traffic is relatively uncongested.

Table 3.2-6 Freeway Peak-Hour V/C Ratio and Existing LOS

Freeway Segment	*Direction*	*Existing Volume*[1]	*Theoretical Capacity*[2]	*V/C*	*LOS*
	NB	4,877	4,400	1.11	F
Kastania Road to Petaluma Boulevard South	SB	2,563	4,400	0.58	A
	NB	4,432	4,400	1.01	F
Petaluma Boulevard S. to Lakeville Highway	SB	2,679	4,400	0.61	B
	NB	5,162	4,400	1.17	F
Lakeville Highway to E. Washington Street	SB	2,980	4,400	0.68	B
E. Washington Street to Old Redwood Highway	NB	4,992	4,400	1.13	F
	SB	3,140	4,400	0.71	C

1. Caltrans Traffic Volumes on California State Highways, 2003
2. Assumes freeway capacity of 2,200 vehicles per hour per lane

Source: Fehr & Peers, June 2005

Public Transit

The City of Petaluma is served by three transit agencies, each of which utilize Washington Street as a key transit route.

Petaluma Transit provides "mini-bus" service within the City limits. Buses operate on 60-minute headways (period of time between buses) during weekdays. All routes start and end at the Downtown bus depot located at the intersection of C and 4th Streets (to be re-located to Copeland Street in 2007).

Sonoma County Transit provides connections to Santa Rosa, Sonoma, Rohnert Park and other destinations within Sonoma County. Headways are generally over an hour. All four routes start and end at the Downtown bus depot located at the intersection of C and 4th Streets (to be relocated to Copeland Street in 2007).

Golden Gate Transit serves commuters traveling to Marin County and San Francisco during peak hours. Golden Gate provides southbound service during the morning peak and northbound service during the evening peak. During peak hours of operation, typical intervals between buses are five to 10 minutes. Little or no service is provided outside of the peak hours in the peak direction.

Key characteristics of transit service in Petaluma are that:

Much of the City is within walking distance of at least one transit line, providing a greater degree of transit coverage than many comparable (i.e., low-density) cities;

Local service is too infrequent for casual transit use, with intervals of at least an hour between each bus. Intervals of 15 minutes or less would be needed for transit to play a more significant role in Petaluma's transportation network;

Circuitous routing on some transit routes discourages ridership;

All routes are accessible to wheelchair passengers; and

Bicycles are allowed on Petaluma Transit and Sonoma County Transit buses. Golden Gate Transit provides bicycle racks on some buses.

Figure 3.2-2 shows the transit routes serving Petaluma.

Pedestrian Circulation

The City's pedestrian network consists of sidewalks, trails and street crossings. In some locations pedestrians share the street with motor vehicles and bicyclists. Petaluma has many areas that seem especially conducive to walking for recreation and transportation, particularly within the Downtown area, along the Petaluma River and its tributary creeks, within some of its neighborhoods and along the urban separator at the city's eastern edge. The City has in the past established policies to encourage improvement of the pedestrian network in those areas, though pedestrian connections between Downtown, the River, and adjacent neighborhoods are not well-developed in many cases.

While Central Petaluma and the West Side are fairly well served by an extensive sidewalk network and pleasant walking conditions, newer sections of the city on the East Side are characterized by discontinuous sidewalk networks and less hospitable walking conditions. Connectivity along creeks and at the city's eastern edge was created through development review processes beginning in the mid-1980s, but many opportunities to improve access remain.

Bicycle Circulation

The City of Petaluma has endorsed policies to encourage bicycling as a form of transportation. Given that 38 percent of Petaluma's working population is employed in Petaluma, construction of a comprehensive citywide bikeway network and support facilities, such as bicycle parking at employment locations and other destinations, could greatly increase the mode share of bicycling

Insert Figure 3.2-2: Transit Map

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as a form of transportation in Petaluma. The existing bikeway network in Petaluma consists of the following routes:[2]

> Class I bicycle paths along portions of several creeks and short sections along the Petaluma River;
>
> Class II bicycle lanes on portions of several streets including McDowell Boulevard, Ely Boulevard, Sonoma Mountain Parkway, Western Avenue, Sunnyslope Road, Rainier Avenue, Lakeville Street; and Riesling Road; and
>
> Class III bicycle routes along segments of McDowell Boulevard, Sky Ranch Drive, Keokuk Street and 5th Street.

Bicycle access along the Northwestern Pacific (NWP) railroad right-of way has been considered for years in both Sonoma and Marin Counties. The Sonoma County Bicycle Plan and SMART commuter rail plan both envision a bicycle path along the right-of-way. In Petaluma, a bicycle path could be constructed adjacent to the tracks, separated by appropriate fencing; however, path construction may not be feasible in some segments due to ROW constraints.

Figure 3.2-3 shows existing and proposed bicycle facilities in Petaluma described in the Draft Bicycle and Pedestrian Plan (attached as Appendix B-1 of the proposed General Plan for adoption as part of the proposed General Plan).

REGULATORY SETTING

The City of Petaluma has jurisdiction over all City streets and City-operated traffic signals, while the County of Sonoma has jurisdiction over roads outside the City limits, including those within the City's UGB. State Routes, including U.S. 101 and Highway 116, are under the jurisdiction of the California Department of Transportation (Caltrans). Public transit agencies with operations in the City are Petaluma Transit, Sonoma County Transit and Golden Gate Transit. The United States Coast Guard has jurisdiction in the Petaluma River, including regulatory authority related to potential drawbridge proposals that could impact ship operations. In addition, there are several regional agencies with jurisdiction related to transportation in Petaluma.

Sonoma Marin Area Rail Transportation District

In 2003, the Sonoma-Marin Area Rail Transit (SMART) District was established to oversee the development and implementation of passenger rail service on the Northwestern Pacific Railroad corridor. The SMART District is charged with planning, engineering, evaluating and implementing passenger train service along a 70-mile corridor from Cloverdale to Larkspur near the Larkspur Ferry Terminal that provides ferry service to San Francisco. The rail corridor, which

2. Class I bikeways are separated from motor vehicle traffic, as in the case of an off-street path along a river or railroad corridor and may be shared with pedestrians. Class II bikeways are located on streets and allow bicyclists to utilize a separate lane of travel, usually 5 feet wide, separated from motor vehicle traffic by a 6-inch white stripe, and include bike lane stencils and signs. Class III bikeways are designated by signs only; cyclists share the travel lane with motor vehicle traffic on these routes.

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Insert Figure 3.2-3: Bicycle Plan Map

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generally parallels U.S. 101 would potentially include two stations in Petaluma, at the historic Petaluma Depot and at Corona Road.

Metropolitan Transportation Commission

The majority of federal, state, and local financing available for transportation projects is allocated at the regional level by the Metropolitan Transportation Commission (MTC), the transportation planning, coordinating, and financing agency for the nine-county Bay Area. The current regional transportation plan, known as Transportation 2030, was adopted by MTC on February 23, 2005. Transportation 2030 specifies a detailed set of investments and strategies throughout the region from 2005 through 2030 to maintain, manage and improve the surface transportation system. The Plan specifies how anticipated federal, state, and local transportation funds will be spent in the Bay Area during the next 25 years. Most of this "committed funding" will go toward protecting the region's existing transportation infrastructure.

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with the authority to develop and enforce regulations for the control of air pollution throughout the Bay Area. The Clean Air Plan is BAAQMD's plan for reducing the emissions of air pollutants that lead to ozone. BAAQMD has also published CEQA Guidelines for the purpose of evaluating the air quality impact of projects and plans. One of the criteria that the Guidelines describe is that plans, including General Plans, must demonstrate reasonable efforts to implement transportation control measures included in the Clean Air Plan that identify local governments as the implementing agencies. On-road motor vehicles are the largest source of air pollution in the Bay Area. To address the impact of vehicles, the California Clean Air Act requires air districts to adopt, implement, and enforce transportation enforce transportation control measures.

IMPACT ANALYSIS

Significance Criteria

Impacts of buildout of the proposed General Plan would be significant if they:

> Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the V/C ratio for freeways, or congestion at intersections);
>
> Exceed, either individually or cumulatively, a level of service (LOS) standard established by the county Congestion Management Agency (Sonoma County Transportation Authority) or City of Petaluma for designated roads or highways;
>
> Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
>
> Substantially increase hazards due to a design feature (i.e., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
>
> Result in inadequate emergency access;
>
> Result in inadequate parking capacity; or
>
> Conflict with adopted policies, plans, or programs supporting alternative transportation.

Based on the City of Petaluma's current transportation impact criteria, the above general significance criteria are interpreted as follows in evaluating the proposed General Plan:

City Roadway and Intersection Impact Criteria. The City's current level of service standard is LOS C. Based on existing CEQA and City of Petaluma standards, traffic impacts are identified as significant if the project would cause:

1. Operations (LOS) at a signalized intersection to deteriorate from an acceptable level (LOS C or better) under conditions without the project to an unacceptable level (LOS D, E, or F);
2. For signalized intersections that operate at an LOS D or E under conditions without the project, the LOS to deteriorate to the next lowest level;
3. For signalized intersections operating at LOS F without the project, any additional vehicle trips to the intersection;
4. For unsignalized intersections operating acceptably (LOS C or better) under conditions without the project, the LOS to deteriorate to unacceptable (LOS D, E, or F) conditions AND the traffic volumes at the intersection would satisfy the Caltrans peak-hour volume warrant criteria for traffic signal installation; or
5. For unsignalized intersections operating at unacceptable levels (LOS D, E, or F) under conditions without the project, average delay to increase by five or more seconds AND the traffic volumes at the intersection would satisfy the Caltrans peak-hour volume warrant criteria for traffic signal installation.

U.S. 101 Impact Criteria. Significant traffic impacts on freeway segments are identified as when a project causes:

1. The volume on the freeway segment to exceed its capacity (Cause LOS E or better to deteriorate to LOS F); or
2. An increase in the amount of traffic on a freeway segment already exceeding its capacity by more than one percent of the freeway segment's design capacity.

Design Review Considerations. A roadway design impact is considered significant when:

1. A project introduces a design feature that presents safety concerns.

Emergency Access Impact Criteria. An emergency vehicle access impact is considered to be significant if it would:

1. Provide inadequate design features to accommodate emergency vehicle access and circulation; or
2. Cause a substantial decrease in travel speeds on primary emergency response routes such that emergency vehicles would be significantly delayed.

Pedestrian Impact Criteria. A pedestrian impact is considered significant if it would:

1. Disrupt existing pedestrian facilities;

2. Interfere with planned pedestrian facilities; or
3. Creates inconsistencies with adopted pedestrian system plans, guidelines, policies or standards.

Bicycle Impact Criteria. A bicycle impact is considered significant if it would:

1. Disrupt existing bicycle facilities;
2. Interfere with planned bicycle facilities;
3. Conflict or create inconsistencies with adopted bicycle system plans, guidelines, policies or standards; or
4. Not provide secure and safe bicycle parking in adequate proportion to anticipated demand.

Transit Impact Criteria. A transit impact is considered significant if it would:

1. Result in a significant unanticipated increase in transit patronage; or
2. Result in development that is inaccessible to transit riders.

Transportation/Traffic Issues not Further Analyzed

Due to the nature and scope of the proposed project (adoption of Draft General Plan 2025), implementation of the project would not have the potential to result in a change in air traffic patterns at the Petaluma Municipal Airport or any other airport in the area. No further analysis of this issue is required.

Sonoma County opted out of performing Congestion Management Plans in 1997. Thus, the proposed project would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways. No further analysis of this issue is required.

Since this analysis focuses on plan-level impacts (rather than the specific design of facilities) there is no analysis of impacts related to emergency response or hazards.

The transportation analysis included in this EIR does not include an evaluation of transportation facilities outside the City limits. Land use data for projected levels of development within Petaluma was provided to Sonoma County for incorporation into the traffic modeling effort that was conducted for the Draft Sonoma County General Plan EIR (Sonoma County, January 2006). Based upon anticipated levels of growth throughout the County, the Draft County General Plan EIR forecasts significant and unavoidable impacts to segments of Adobe Road, Main Street (Penngrove), Petaluma Boulevard and Petaluma Hill Road. The Draft County General Plan EIR also identifies significant and unavoidable impacts to several State highways, including portions of U.S. 101 in several areas between Cotati to north of Windsor. Growth anticipated to occur within Petaluma will contribute to these significant and unavoidable impacts to County roads and highway segments. Since the County's traffic model already incorporates this growth in its analysis, no additional analysis is included in this EIR.

Methodology & Assumptions

Impacts are assessed based upon comparison between existing conditions (based on data collected from 2001 to 2005) and future (Year 2025) with project conditions. For purposes of this EIR, future with project conditions are based on forecasted Year 2025 land uses and transportation improvements described in the proposed General Plan.

Planned Roadway Improvements

Several new roadways and "cross-town connectors" are incorporated in the proposed General Plan to help reduce traffic congestion at freeway interchanges and crossings of the Petaluma River. The analysis of future conditions assumes these improvements identified in the proposed General Plan will be in place by the Year 2025 (see Figure 3.2-4):

East Washington Street Interchange Improvements. The East Washington Street Interchange has long been one of the City's most congested areas. Improvements are planned to upgrade and realign existing freeway ramps and provide an additional ramp to Northbound U.S. 101.

Rainier Avenue Extension and Interchange. Rainier Avenue will be extended to connect with a new freeway interchange on U.S. 101 between Washington Street and Corona Road and provide another cross-town travel route and access to U.S. 101.

North Petaluma Boulevard Grid. A grid of streets will be developed near North Petaluma Boulevard adjacent to the Rainier Avenue extension and a planned southward extension of Industrial Avenue.

Caulfield Lane Extension. A "Southern Crossing" of the Petaluma River is incorporated to reduce traffic congestion along the D Street and Washington Street corridors. A connecting grid of streets will be developed near Caulfield Lane between the River and Lakeville Street.

Old Redwood Highway Interchange Widening. The Old Redwood Highway interchange between Petaluma Boulevard North and North McDowell Boulevard would widen Old Redwood Highway to four lanes with bicycle lanes.

Copeland Street Extension. Copeland Street would be extended across the Petaluma River to connect with Petaluma Boulevard North in the vicinity of Oak Lane. A minor grid street system between the Boulevard, Lakeville, East Washington and the River would also improve localized traffic movements.

Caulfield Lane/Payran Street Intersection Improvements. Install a westbound right-turn lane on Caulfield Lane.

Petaluma Boulevard/Magnolia Avenue – Payran Street Intersection. Add right-turn lanes on Petaluma Boulevard in both the northbound and southbound directions. In order to reduce impacts to pedestrians resulting from increased crossing distances, install a median refuge (at least five feet wide) for pedestrians crossing Petaluma Boulevard.

Insert Figure 3.2-4

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U.S. 101 Widening. Continued growth and congestion on the U.S. 101 corridor has led to plans to expand the highway from four to six lanes with the addition of high occupancy vehicle (HOV) lanes. Although this project is not fully funded as of February 2006, this analysis assumes this widening to occur by 2025, consistent with County transportation planning assumptions.

Travel Demand Forecasting Model

The City of Petaluma conducted an update and conversion of the city-wide travel demand forecasting (TDF) model as part of continued planning efforts to address transportation infrastructure needs and assist in the update of the City's General Plan. Based upon year 2025 proposed General Plan land use data (provided by Dyett & Bhatia), the TDF model was used to generate traffic volume forecasts and other travel demand data so that future roadway deficiencies resulting from implementation of the City's proposed General Plan can be determined and mitigated.

The model forecasts daily, AM peak hour and PM peak hour traffic conditions. The major inputs to the model are land use data and network (i.e., roadways) assumptions. The model outputs relate primarily to auto travel, but some conclusions can also be inferred for alternative transportation modes.

The City of Petaluma model contains a unique modeling module related to estimating travel associated with the proposed use of the SMART corridor for passenger rail service. This facility would impact the city in two ways: (1) it will increase the number of people using transit, largely for home-to-work trips; and (2) it will result in localized traffic in and around the transit stations in Petaluma.

Summary of Impacts

This section describes the potential impacts on the transportation system resulting from buildout of the land uses described in the proposed Petaluma 2025 General Plan in conjunction with the transportation improvements and policies that are described in the Mobility Element (see Chapter 5 of the proposed General Plan).

The Mobility Element identifies long-range transportation needs for moving people and goods in and around Petaluma. It is comprehensive and far-reaching, addressing bicycle, motor vehicle and pedestrian travel as well as public transit, rail, air, and water travel. A range of public safety, environmental, and social equity issues associated with transportation are addressed through the policies and standards identified in the Mobility Element. See Chapter 2, Project Description, for a discussion of the primary mobility priorities contained in the proposed General Plan.

Motor Vehicle Circulation

In the last 20 years, Petaluma's population has increased by just over 40 percent. A general trend nationwide has been that increases in trips and trip length proceed at a higher rate than growth in population. This is due in part to changing lifestyles (the prevalence of two-income families and a greater percentage of non-work trips on a day-to-day basis) and increased reliance on the private automobile. Petaluma's roadways currently experience congestion during peak travel periods. Even with substantial increases in alternative mode shares in the years ahead, automobile travel in

Petaluma will remain the form of transportation used for most trips. Potential impacts are evaluated at study intersections and freeway segments.

Future Intersection Operations

LOS was forecast at each of the 46 study intersections (shown in Figure 3.2-1). Lane geometries with buildout of the Petaluma 2025 General Plan are shown in Figure 3.2-7 (see the end of this section). The city-wide travel demand forecasting (TDF) model was used to generate traffic volume forecasts resulting from implementation of the proposed General Plan, shown in Figure 3.2-8 (see the end of this section). This data was used to determine the peak LOS rating, or hour when the highest number of vehicles passed through the intersection during each commute period. Table 3.2-7 lists each study intersection along with a comparison of the AM and PM peak level of service for existing conditions and future conditions.

Table 3.2-7 Intersection Level of Service, Future with Project (Year 2025) Conditions

		LOS[3]/Delay (Seconds/Vehicle)[2]			
		Existing		Future with Project	
Intersection	Control[1]	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1. Old Redwood Highway / McDowell Boulevard N. Extension	Signal	A / 6.3	B / 14.8	A / 5.5	A / 6.9
2. Old Redwood Highway / Redwood Way	Signal	B / 10.1	B / 17.6	B / 14.0	B / 16.8
3. Old Redwood Highway / McDowell Boulevard N.	Signal	C / 27.3	D / 46.3	D / 38.3	D / 53.6
4. Petaluma Boulevard N./ Stony Point Rd / Industrial Ave	Signal	C / 28.5	C / 27.1	D / 46.3	D / 44.4
5. Petaluma Blvd N./ Corona Rd	Signal	D / 38.5	D / 38.2	D / 51.1	D / 49.3
6. Petaluma Boulevard N./ Factory Outlets / Oak Lane	Signal	B / 12.0	B / 12.5	A / 8.2	C / 28.4
7. Sonoma Mountain Parkway / Corona Rd	Round-about	B / 10.8	B / 13.1	B / 12	B / 12
8. McDowell Boulevard N./ Corona Rd	Signal	C / 33.5	C / 30.5	E / 58.0	D / 43.4
9. Sonoma Mountain Parkway / Ely Road	Signal	B / 14.7	B / 16.6	C / 23.4	C / 27.7
10. Sonoma Mountain Parkway / Rainier Circle / Rainier Avenue	Signal	B / 15.2	B / 13.6	C / 21.0	C / 23.3
11. Sonoma Mountain Parkway / Washington Street*	Signal	C / 30.4	D / 42.8	D / 45.0	E / 57.4
12. Maria Drive / E. Washington Street*	Signal	B / 17.5	C / 28.8	C / 23.4	C / 34.6
13. McDowell Boulevard N./ Rainier Avenue*	Signal	A / 9.6	B / 11.4	D / 40.9	E / 55.5
14. McDowell Boulevard N./ Lynch Creek Drive	Signal	B / 12.2	B / 13.8	B / 12.4	B / 14.2
15. McDowell Boulevard N./ E. Madison Street*	Signal	B / 14.5	B / 18.2	B / 18.4	C / 31.5
16. McDowell Boulevard/ Washington Street*	Signal	C / 31.2	D / 48.0	C / 28.1	D / 37.4
17. McDowell Boulevard S./Caulfield Lane	Signal	B / 13.8	B / 13.1	C / 33.4	D / 39.8
18. E. Washington Street / Ellis Street / Kenilworth Drive*	Signal	C / 29.3	C / 20.1	D / 35.3	D / 38.5
19. Caulfield Lane / Payran Street*	Signal	B / 14.3	C / 22.2	D / 42.4	D / 43.7
20. Lakeville Street / Caulfield Lane*	Signal	B / 18.5	C / 22.6	D / 47.3	E / 65.3
21. E. Washington Street / Lakeville Street*	Signal	B / 21.2	C / 24.5	C / 24.2	D / 35.9
22. Lakeville Street / E. D Street*	Signal	C / 26.4	C / 32.4	D / 41.5	E / 69.4
23. Petaluma Boulevard S. / I Street	Signal	C / 28.0	B / 12.0	B / 19.2	B / 17.0
24. Petaluma Boulevard S./ Mountain View Ave	Signal	B / 11.8	A / 9.2	B / 11.0	A / 9.8
25. Petaluma Boulevard S./ McNear Avenue	Signal	A / 8.2	A / 7.5	A / 8.5	B / 11.2
26. Petaluma Boulevard N./ Shasta Avenue	Signal	A / 8.8	A / 8.9	C / 20.7	D / 43.5
27. Petaluma Boulevard N./ Payran Street / Magnolia Ave*	Signal	C / 24.9	D / 37.9	C / 31.8	D /61.0
28. Petaluma Boulevard N./ Lakeville Street	Signal	B / 17.1	C / 31.3	B / 12.0	C / 20.6
29. Petaluma Boulevard N./ Washington Street	Signal	C / 29.9	D / 36.9	D / 37.5	D /52.0
30. Washington Street / Bodega Avenue / Howard Street	Signal	B / 19.6	C / 20.6	B / 15.7	B / 17.5
31. Washington Street / Bodega Avenue/Webster	Signal	A / 6.9	A / 6.9	A / 8.5	A / 8.9

Table 3.2-7 Intersection Level of Service, Future with Project (Year 2025) Conditions

		LOS[3]/Delay (Seconds/Vehicle)[2]			
		Existing		*Future with Project*	
Intersection	*Control[1]*	*AM Peak Hour*	*PM Peak Hour*	*AM Peak Hour*	*PM Peak Hour*
Street					
32. Western Avenue / Kentucky Street	Signal	A / 5.0	A / 7.1	A / 7.9	A / 8.9
33. Petaluma Boulevard / B Street	Signal	A / 6.8	A / 6.2	A / 6.9	A / 7.1
34. Petaluma Boulevard S./ D Street*	Signal	C / 30.5	E / 57.1	C / 34.9	E / 71.1
35. Old Redwood Highway / NB Ramps	Signal	B / 19.1	B / 13.6	B / 17.0	B / 14.4
36. Old Redwood Highway / SB Ramps	Signal	C / 25.7	B / 16.0	B / 14.2	A / 9.7
37. East Washington Street / NB Ramps	Signal	B / 18.8	C / 21.3	A / 7.3	B / 13.4
38. East Washington Street / SB Ramps*	Signal	D / 37.5	C / 28.1	C / 23.6	C / 23.1
39. Lakeville Street / Lindberg Lane	SSSC	B / 14.3	C / 20.4	C / 22.3	F />50.0
40. Lakeville Street / NB Ramps*	Signal	A / 9.2	A / 9.9	B / 11.2	B / 15.3
41. Lakeville Street / SB Ramps*	Signal	C / 22.6	B / 15.3	C / 20.8	C / 23.7
42. Lakeville Highway / Baywood Drive	Signal	D / 37.9	C / 33.8	C / 29.5	D / 47.6
43. Petaluma Boulevard South / SB Ramps	SSSC	B / 11.6	C / 15.2	B / 11.3	B / 14.9
44. Rainier Extension / NB Ramps*	Signal	N.A.	N.A.	A / 9.9	B / 16.3
45. Rainier Extension / SB Ramps*	Signal	N.A.	N.A.	B / 16.9	C / 20.9
46. Payran Street / Washington Street	Signal	C / 29.9	C / 28.5	C / 29.8	C / 34.1

Note: Bold indicates unacceptable operations (LOS D or worse) based on City's current LOS criteria (1987 General Plan).

1. Signal = Signalized intersection; SSSC = Side Street Stop Controlled Intersection
2. Delay in seconds calculated using the 2000 Highway Capacity Manual. Worst approach reported for SSSC intersections
3. LOS = Level of Service

* Intersection likely affected by queues from neighboring intersections, resulting in additional delay that may not be captured by traditional LOS analysis. This condition would not trigger a significant impact based on the City's current intersection impact criteria.

Source: Fehr & Peers, 2006

Impacts to study intersections would occur at the following 16 locations that would deteriorate from an acceptable LOS (C or better) under existing conditions to an unacceptable LOS (D or worse based on the 1987 General Plan standard) under future conditions with buildout of the proposed General Plan during the AM and/or PM peak hour:

Old Redwood Highway / McDowell Boulevard N.

Petaluma Boulevard N. / Stony Point Road / Industrial Avenue

McDowell Boulevard N./ Corona Road

Sonoma Mountain Parkway / E. Washington Street

McDowell Boulevard N. / Rainier Avenue

McDowell Boulevard S./ Caulfield Lane

E. Washington Street / Ellis Street / Kenilworth Drive

Caulfield Lane / Payran Street

Lakeville Street / Caulfield Lane

E. Washington Street / Lakeville Street

Lakeville Street / E. D Street

Petaluma Boulevard N. / Shasta Avenue

Petaluma Boulevard N. / Payran Street / Magnolia Avenue

Petaluma Boulevard N./ Washington Street

Lakeville Street / Lindberg Lane

Lakeville Highway / Baywood Drive

At the following three study intersections, intersection operations are unacceptable under Existing Conditions (LOD D or worse) and will not deteriorate to a lower letter grade under Future with Project. Therefore, impacts are less than significant at these locations:

Petaluma Boulevard N./ Corona Road

McDowell Boulevard / E. Washington Street

Petaluma Boulevard S. / D Street

Several intersections on E. Washington Street, Lakeville Street and Petaluma Boulevard are potentially impacted by queuing that extends between intersections, resulting in additional delay that may not be captured by traditional LOS analysis. This condition would not trigger a significant impact based on the City's current intersection impact criteria.

Freeway Operations

U.S. 101 currently operates at or near capacity on many freeway segments in the Petaluma area. Since the citywide traffic model may be less than reliable in forecasting future increases in traffic on U.S. 101 generated by land uses outside of the City of Petaluma, forecasts of future freeway traffic volumes were obtained from the Sonoma County Year 2020 Traffic Model.[3] Land use assumptions in the County model are based on the County's proposed General Plan land uses and regional growth projections prepared by the Association of Bay Area Governments (ABAG), including projections for growth within Petaluma and other Marin and Sonoma County cities and towns.

The future analysis assumes the addition of an HOV lane to U.S. 101 through Petaluma in both directions. Because this lane is not available to all traffic during peak hours, the capacity of this

3. The Sonoma County model assumes that land uses in Petaluma would occur consistent with the previously adopted General Plan and subsequent amendments (such as the Central Petaluma Specific Plan). Although the new General Plan will generate slightly less traffic, the higher volumes derived from the County model are retained for this EIR in order to present a conservative analysis.

lane was assumed to be one-half that of an unrestricted freeway lane, or 1,100 vehicles per lane per hour. This is consistent with previous freeway analyses conducted in Petaluma. The County traffic model also reflects anticipated increases in employment in Santa Rosa that are expected to lessen the dominant traffic flow patterns (currently northbound during the PM peak hour) and result in a greater amount of northbound AM and southbound PM trips on the U.S. 101 corridor.

Table 3.2-8 compares the existing and future traffic volumes, V/C ratios, and the resulting LOS on US 101. As shown on the table, although traffic would increase on most segments, the V/C ratio would reduce due to the addition of HOV lanes. Therefore, operations are forecast to operate acceptably (LOS E or better) and no significant impacts on freeway operations would occur on segments within Petaluma. These findings are consistent with the Sonoma County 2020 Draft EIR (County of Sonoma, 2006) and Sonoma-Marin Area Rail Transit Draft EIR (SMART, 2005).

Table 3.2-8: Freeway Peak-Hour V/C Ratio and LOS Summary Future (Year 2020) with Project Conditions

		Existing Conditions				*Future with Project Conditions*			
Freeway Segment	*Direction*	*Theoretical Capacity*[1]	*Volume*	*V/C*	*LOS*	*Theoretical Capacity*[1]	*Volume*	*V/C*	*LOS*
Kastania Road to Petaluma Boulevard S.	NB	4,877	4,400	1.11	F	5,500	5,338	0.97	E
	SB	2,563	4,400	0.58	A	5,500	2,715	0.49	A
Petaluma Boulevard S. to Lakeville Highway	NB	4,432	4,400	1.01	F	5,500	4,480	0.81	D
	SB	2,679	4,400	0.61	B	5,500	2,569	0.47	A
Lakeville Highway to E. Washington Street	NB	5,162	4,400	1.17	F	5,500	4,672	0.85	D
	SB	2,980	4,400	0.68	B	5,500	2,988	0.54	A
E. Washington Street to Old Redwood Highway	NB	4,992	4,400	1.13	F	5,500	4,424	0.80	C
	SB	3,140	4,400	0.71	C	5,500	3,594	0.65	B

1. Assumes freeway capacity of 2,200 vehicles per hour per regular lane (existing and future conditions) and 1,100 vehicles per hour per HOV lane (future conditions only).

Source: Fehr & Peers, February 2006

Public Transit

While transit does not currently play a major role for travel within Petaluma, the proposed General Plan seeks to foster increased transit use and a greater emphasis on transit in planning for future transportation. In the long term, this could include SMART passenger rail service, increased frequency bus service with transit priority, transit-oriented development practices and the development of transit corridors (including potential "bus rapid transit" routes) along Washington Street and Petaluma Boulevard. Future enrollment growth at the Petaluma Campus of Santa Rosa Junior College could also generate a need for additional transit amenities to serve students and faculty. In addition, a local non-profit group is pursuing funding for restoration of a historic trolley line that could connect Downtown and the Factory Outlets and would be intended to facilitate tourism and riverfront activity.

Increased demand for transit service could result in significant impacts if transit service is not enhanced to keep pace with demand such as through increased frequency of service within the city, especially between the neighborhoods and Central Petaluma, and to neighboring cities along the U.S. 101 corridor, where many of Petaluma's residents work. In addition, expanded service hours would necessitate increased transit subsidies, which would likely need to come from local sources.

Pedestrian and Bicycle Circulation

The proposed Petaluma General Plan seeks to promote walking within Petaluma by improving pedestrian conditions, increasing pedestrian safety, and creating a land use context supportive of pedestrian travel. The proposed General Plan 2025 also includes adoption of an updated Bicycle and Pedestrian Plan that contains the following overall goal and objectives:

GOAL: Create and maintain a safe, comprehensive, and integrated bicycle and pedestrian system throughout Petaluma for all ages and abilities.

- **Objective A:** Implement the bikeway system as outlined in the Bicycle and Pedestrian Plan, and expand and improve the bikeway system wherever the opportunity arises.
- **Objective B:** Create a pedestrian environment accessible to all that is safe, attractive, and encourages walking.
- **Objective C:** Establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel.
- **Objective D:** Make bicycling and walking more desirable by providing necessary support facilities throughout the city.
- **Objective E:** Promote more non-motorized transportation through encouragement, enforcement, education, and infrastructure improvements.
- **Objective F:** Fund and perform regular maintenance on all public bicycle and pedestrian facilities.
- **Objective G:** Utilize a creative variety of measures to fully implement all projects and programs of the Petaluma Bicycle and Pedestrian Plan.

Adoption of the General Plan will be consistent with existing plans promoting bicycle and pedestrian circulation and will not disrupt existing facilities or interfere with planned facilities. However, a potentially significant impact on bicycle circulation could result if the proposed General Plan does not ensure provision of secure and safe bicycle parking in adequate proportion to anticipated demand.

Impacts and Mitigation Measures

Impact 3.2-1 Increased motor vehicle traffic would result in unacceptable level of service (LOS) at study intersections. (Significant and Unavoidable)

Buildout of the land uses envisioned in the Petaluma General Plan would result in significant impacts at the following 16 study intersections:

Old Redwood Highway / McDowell Boulevard N.

Petaluma Boulevard N. / Stony Point Road / Industrial Avenue

McDowell Boulevard N. / Corona Road

Sonoma Mountain Parkway / E. Washington Street

McDowell Boulevard N. / Rainier Avenue

McDowell Boulevard S. / Caulfield Lane

E. Washington Street / Ellis Street / Kenilworth Drive

Caulfield Lane / Payran Street

Lakeville Street / Caulfield Lane

E. Washington Street / Lakeville Street

Lakeville Street / East D Street

Petaluma Boulevard N. / Shasta Avenue

Petaluma Boulevard N. / Payran Street / Magnolia Avenue

Petaluma Boulevard N. / Washington Street

Lakeville Street / Lindberg Lane

Lakeville Highway / Baywood Drive

Proposed General Plan Policies that Reduce the Impact

The following proposed policies and programs would reduce this impact to a less than significant level at most study intersections:

5-P-1 Develop an interconnected mobility system that allows travel on multiple routes by multiple modes.

A. Develop a network that categorizes streets according to function and type, considering the surrounding land use context.

B. Develop a network for off-street paths and routes according to function and type, considering the intensity of use and purpose.

C. Review and update the City's Street Design Standards to be consistent with street function and typology, using Figure 5-2 as a guide.

Explore the redesign of designated main and mixed use streets to potentially reduce the width and/or number of travel lanes, improve the multimodal function of intersections, and introduce amenities such as wider sidewalks, special paving treatments, bus priority treatments, landscaped medians, and street trees within parking lanes.

D. Evaluate the feasibility of road diets on streets with projected excess capacity at buildout.

5-P-2 Ensure the identified mobility system is provided in a timely manner to meet the needs of the community.

A. Ensure new developments pay a fair share of mobility improvements and that those improvements are undertaken in context with that development.

B. Review City transportation impact fees to insure that necessary citywide improvements are funded.

C. Allocation of mitigation funds shall be designated to the specific capital improvement project for which it was exacted.

5-P-3 Ensure public improvements are constructed and maintained in a manner that is economically feasible to the budgetary constraints of the City.

A. Establish priorities for transportation improvements and prepare an action program to implement identified street improvements.

B. Investigate innovative means to fund the design, construction, and maintenance of both neighborhood and community-wide mobility infrastructure.

5-P-4 New development and/or major expansion of change of use may require construction of off-site mobility improvements to complete appropriate links in the network necessary for connecting new with existing neighborhoods and land uses.

5-P-5 Consider impacts on overall mobility and travel by multiple travel modes when evaluating transportation impacts.

5-P-8 The priority of mobility is focused on the movement of people within the community including the preservation of quality of life and community character.

A. Develop formal transportation impact analysis guidelines that consider multi-modal impacts of new developments.

B. Develop and adopt multi-modal level of service (LOS) standards that examine all modes and vary the standards by facility type to imply a preference to selected modes based upon the context (including street type and location).

C. LOS analysis data shall utilize the peak period rather than the peak hour for determining intersection LOS.

5-P-10 Maintain a level of service (LOS) standard for motor vehicle circulation that ensures efficient traffic flow and supports multi-modal mobility goals. LOS should be maintained at Level D or better for motor vehicles due to traffic from any development project.

5-P-11 Require proposed development to assist, in addition to seeking other funding sources, in the funding and construction of the following improvements:

Washington Street/Highway 101 interchange improvements

Rainier Avenue extension and interchange

Caulfield Lane extension to Petaluma Boulevard South (southern crossing)

Old Redwood Highway interchange widening

Copeland Street extension to Petaluma Boulevard North

Caulfield Lane/Payran Street Intersection Improvements

Petaluma Boulevard/Magnolia Avenue Payran Street Intersection.

5-P-13 Encourage existing major employers to develop and implement Transportation Demand Management programs to reduce peak-period trip generation.

A. Study the feasibility of a citywide TDM program that would be funded by annual fees or assessments on new development.

B. Assign a proportion of TDM fees to Petaluma Transit for expansion of service and future fare reductions or fare elimination.

C. As part of the development code, require TDM measures for all new non-residential development.

D. Assign trip reduction credits and reduced transportation impact fees for demonstrated commitment to TDM strategies.

E. Reduce parking requirements for mixed-use developments and for developments providing shared parking or a TDM program.

F. Establish a TDM program for City of Petaluma employees.

G. Collaborate with Santa Rosa Junior College to minimize the impact of future enrollment growth on local traffic and parking demand, such as through TDM measures, limitations on parking near the College and on-campus parking management.

Following adoption of the revised LOS criteria called for by the proposed General Plan, LOS D would be acceptable at study intersections. Therefore, impacts would be less than significant at most study intersections, except for the following seven intersections that will operate at LOS E or worse:

McDowell Boulevard / Corona Road (LOS E during A.M. peak hour)

Lakeville Street / Caulfield Lane (LOS E during P.M. peak hour)

Lakeville Street / D Street (LOS E during P.M. peak hour)

Petaluma Boulevard / D Street (LOS E during P.M. peak hour)

Sonoma Mountain Parkway / Washington Street (LOS E during P.M. peak hour)

McDowell Boulevard / Rainier Avenue (LOS E during P.M. peak hour)

Lakeville Street / Lindberg Lane (LOS F during P.M. peak hour)

The intersection of Lakeville Street / Lindberg Lane is a side-street stop-controlled intersection with delay experienced by traffic approaching from the side street. Existing side-street approach volumes are approximately 50 trips during the A.M. peak hour and 30 trips during the P.M. peak hour. Under future conditions, side-street volumes are not forecasted to exceed 100 trips. Since side-street volumes are not sufficient to meet a volume warrant for signalization of this intersection, this impact is considered less than significant at this location.

Significant impacts would remain at six study intersections. Installing additional lanes or expanding capacity at these locations would conflict with proposed General Plan goals and policies related to improving multi-modal circulation and preserving the pedestrian environment of Central Petaluma. Therefore, no mitigations are identified. Intersection impacts at these locations are significant and unavoidable:

McDowell Boulevard N. / Corona Road

Lakeville Street / Caulfield Lane

Lakeville Street / East D Street

Petaluma Boulevard S. / D Street

Sonoma Mountain Parkway / E. Washington Street

McDowell Boulevard N. / Rainier Avenue

Mitigation Measures

None identified.

Impact 3.2-2 Implementation of the proposed General Plan could cause increased demand for transit service. (Less than Significant)

According to the 2000 U.S. Census, five percent of Petaluma residents use transit for their journey to work. Based upon the current mode split, it is reasonable to assume that implementation of the proposed General Plan 2025 would result in additional residential and non-residential trips and a corresponding increase in demand for transit service.

Proposed General Plan Policies that Reduce the Impact

The following proposed policies related to transit improvements and priorities would reduce this impact:

5-P-40 Expand the bus transit system so that it is convenient and provides frequent, regular service along major City corridors serving shopping and employment destinations.

A. Identify increased funding sources for local transit service and improvements.

5-P-41 Support efforts for transit oriented development around the Petaluma Depot and along the Washington Street and Petaluma Boulevard transit corridors.

A. Reserve and plan for future bus stop enhancement and transit priority along Washington Street and Petaluma Boulevard.

5-P-42 Maintain a transit system of nominal cost to riders.

A. Investigate the creation of subsidies for designations such as education, significant employment, and/or recreation destinations.

B. Collaborate with Santa Rosa Junior College to promote measures to enhance transit access and service at the Petaluma Campus.

5-P-43 Coordinate transit improvement efforts between Petaluma Transit, Sonoma County Transit, Golden Gate Transit, and SMART.

5-P-44 Consider benefits to the possible consolidation of transit serving agencies.

Given existing mode splits, increases in transit demand are unlikely to result in a significant unanticipated increase in transit patronage or be inaccessible to transit riders. Current transit services provide transit service that is within walking distance of most residents. Therefore, this impact is less than significant.

Mitigation Measures

None required.

Impact 3.2-3 Provision of secure and safe bicycle parking may be inadequate. (Less than Significant)

Implementation of the proposed General Plan would result in additional residential and non-residential trips and a corresponding increase in demand for bicycle facilities, including safe and secure bicycle parking. The proposed General Plan includes an updated Bicycle and Pedestrian Plan (included in Appendix B-1 of the General Plan). However, implementation of the Bicycle and Pedestrian Plan may not fully satisfy the need for increased bicycle parking. According to the 2000 U.S. Census, 0.9 percent of Petaluma residents used a bicycle to commute to work.

Proposed General Plan Policies that Reduce the Impact

The following proposed policy related to the provision of bicycle parking would reduce this impact:

5-P-31 Make bicycling and walking more desirable by providing or requiring development to provide necessary support facilities throughout the city.

A. Provide secure, protected parking facilities and support services for bicycles at locations with high bicycle-parking demands such as multi-family housing and shopping and employment centers.

Given current rates of bicycling in Petaluma (based on the mode split data from the U.S. Census) and taking into account the policy stated above, this impact will be less than significant.

Mitigation Measures

None required.

Impact 3.2-4 Implementation of the proposed General Plan could result in increased demand for motor vehicle parking. (Less than Significant)

Implementation of the proposed General Plan would result in additional residential and non-residential trips and a corresponding increase in demand for motor vehicle parking. Central Petaluma experiences high parking demand on weekdays during business hours and on weekends. Recent parking studies have been performed for Central Petaluma and have recommended increased parking enforcement and strategies to discourage employees from occupying public, short-term parking spaces in the core area. The provision of dedicated long-term employee parking in the Keller Street Garage was also recommended. An additional parking garage is located at 1st and D Street. More detailed recommendations pertaining to parking needs and potential garage locations are provided in the Central Petaluma Specific Plan.

Proposed General Plan Policies that Reduce the Impact

Parking polices have the potential to impact the mode choices of residents, employees and retail customers. The City's development review process implements parking requirements that are intended to ensure that adequate numbers of parking spaces are provided for most land uses. In addition to the TDM measures identified under Policy 5-P-13, which includes programs designed to reduce the demand for parking, the following General Plan policy would reduce the impact on parking demand.

5-P-14 To the extent deemed feasible and appropriate by the City, maximize shared parking opportunities and support the construction of additional structured parking in Central Petaluma.

With implementation of the TDM and parking management policies included in the proposed General Plan, impacts to parking should be less than significant.

Mitigation Measures

None required.

Figure 3.2-5

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Figure 3.2-6

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Figure 3.2-7

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Figure 3.2-8

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3.3 PARKS AND RECREATION

This chapter presents the environmental setting and impact analysis for parks, open space and recreational resources in Petaluma. Additional information on existing parks and community facilities is contained within the *Petaluma General Plan 2025: Existing Conditions, Opportunities, and Challenges Report*.

ENVIRONMENTAL SETTING

Physical Setting

Existing Park, Open Space and Recreational Facilities

Parks and open spaces are integral to Petaluma's character, comprising a substantial portion of land—nearly 1,500 acres, 17 percent of acreage—within the Urban Growth Boundary (UGB). Existing park and open space acreages within city limits are listed in Table 3.3-1; these include both City-owned and maintained parks and open space as well as open space maintained by other agencies. Park and open space locations are depicted in Figure 3.3-1. City-owned facilities are broken down into greater detail in subsequent tables.

Table 3.3-1: Park and Open Space Acreage in Petaluma

Type	*Existing (2005)*
City Owned Parks	**200.5**
Community (See Table 3.3-2)	125.3
Neighborhood (See Table 3.3-3)	73
Other (See Table 3.3-4)	2.2
Regional (See Table 3.3-5)	**256**
Partnerships/Private Recreation	**493**
Open Space	**527**
Total	**1477**

City-Owned Parks and Recreational Facilities

The City of Petaluma currently owns and maintains a full range of open space and recreational resources, including many community, neighborhood, and pocket parks, which are described below. The City also provides recreational resources through public-private partnerships and joint-use relationships with the Petaluma City Schools.

Community Parks

Community parks serve a citywide population and typically include sports facilities, such as lighted fields, courts, swimming pools, recreation buildings, and other special-use facilities. Restrooms and off-street parking are generally provided. The largest community parks in the city are Lucchesi, Wisemen, and Prince parks. Some community parks are designed to showcase a significant natural or artificial feature and do not provide active recreation facilities. Shollenberger Park, for example, is a community park designed around a dredge disposal area in the southeastern portion of the city, with additional pathways stretching through the adjacent Alman Marsh to the Petaluma Marina and planned future pathway connections through the Ellis Creek Water Recycling Facility. Other community parks include major public amenities such as the library and teen center at Kenilworth Park. Although community parks have a much larger service area than neighborhood parks, they often serve a neighborhood function as well. Community park sites are listed in Table 3.3-2 and their locations are shown in Figure 3.3-1 by the Map Code listed on the left side of the table.

Table 3.3-2: Existing Community Parks

Map Code	*Parks*	*Active*	*Passive*	*Estimated Acreage*
1	Lucchesi	x		31
2	McNear	x		8
3	Prince Park	x		22
4	Rocky Memorial Dog		x	10
5	Shollenberger		x	16
6	Wiseman	x		21
7	Kenilworth	x		3
8	Leghorns	x		7
9	Steamer Landing		x	5
43	Petaluma Swim Center & Skate Park	x		2.3
	Total Community Parks			**125.3**

Neighborhood Parks

Neighborhood parks are devoted primarily to serving a small portion of the city, usually within walking and biking distance from residences. These parks are typically designed for non-organized and unsupervised recreation activities. Play equipment, ball fields, and open turf areas, and picnic tables may be provided, although restrooms and off-street parking are generally not provided. Neighborhood parks typically measure between three and five acres, though some parks are larger. Table 3.3-3 lists neighborhood parks in Petaluma.

Fig. 3.3-1

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Table 3.3-3: Existing Neighborhood Parks

Map Code	*Parks*	*Active*	*Passive*	*Estimated Acreage*
10	Arroyo		x	3
11	Bond	x		6
12	Casa Del Oro	x		3
13	Cherry Valley		x	1
14	Country Club		x	2
15	Eagle	x		4
16	Glenbrook		x	4
17	Grant		x	1
18	La Tercera	x		3
19	McDowell	x		4
20	McDowell Meadows		x	1
21	Meadow View		x	3
22	Miwok	x		4
23	Oak Hill	x		5
24	Penry		x	1
25	Sunrise		x	3
26	Turnbridge		x	3
27	Walnut		x	2
28	Westridge Open Space		x	4
29	Wickersham		x	2
30	Southgate		x	1
31	Westhaven (Rockridge Pointe)		x	2
32	Mannion Knoll		x	7
33	Fox Hollow/Turtle Creek		x	4
	Total Neighborhood Parks			**73**

Pocket Parks

Pocket parks are very small park sites (often less than one acre) providing tot lots and small-scale facilities to a localized area. The city contains approximately 2.2 acres of pocket parks, many of which are located within or near multifamily developments. Table 3.3-4 lists the pocket parks in Petaluma.

Table 3.3-4: Existing Pocket Parks

Map Code	*Parks*	*Active*	*Passive*	*Estimated Acreage*
34	Center		x	0.1
35	Crinella		x	0.3
36	Howard & Liberty		x	0.2
37	Maria & Sonoma Mt. Parkway		x	0.3
38	Putnam Plaza		x	0.2
39	Sunset		x	0.5
40	Western & Baker		x	0.2
41	Anna's Meadows		x	0.3
42	Cavanagh Landing		x	0.1
	Total Pocket Parks			**2.2**

Public-Private Partnerships

The City of Petaluma owns 161 acres of recreational facilities that are under contract with private organizations. These public-private partnerships allow this expansive recreational acreage to be used and maintained by private organizations, which reduces the City's fiscal burden for the operations and maintenance costs. As part of the lease contract, the City receives a portion of the revenues collected by the facility and controls the setting of public use fees. One facility that falls under the public-private partnership includes the Rooster Run Golf Course. Rooster Run is a 161-acre golf course located at the northeastern edge of the city on East Washington Street, near the Petaluma Municipal Airport.

Joint-Use Recreational Facilities and Playing Fields

The City, Petaluma City Schools, and the other school districts have joint-use agreements that permit the shared use of many parks and recreation facilities located on or near several school sites. These agreements allow both weekday student users, and after-school and weekend users to access and use the facilities. The following schools have joint-use facilities on school property, or in several locations, on City-owned lands within the Urban Separator (U.S.):

Table 3.3-5: Joint-Use Facilities

Facility	*Acres*[1]
Petaluma Junior High School	5.5
Petaluma High School	2
Sonoma Mt. Elementary (U.S.)[2]	4
Casa Grande High School	28
La Tercera Elementary School	4
Miwok Elementary School	2
Bernard Eldridge Elementary School	2
Cherry Valley Elementary School	1
Meadow School	2.5

McNear Elementary School	1
McDowell Elementary School	2
Kenilworth Junior High School (U.S.)[2]	4
Corona Creek School (U.S.)[2]	4
Total	**62**

1. Approximate acreage of joint-use facilities.
2. Joint -use facility on city-owned land/urban separator

Regional Parks

Associated governmental agencies, such as the County and the State, also operate parks and recreational facilities within the Petaluma Planning Area. Petaluma Adobe State Historic Park, east of the Petaluma city limits, is owned and operated by the California State Parks Department. The 256-acre Helen Putnam Regional Park (see number 44 on Figure 3.3-1), located at the western edge of the city, is run by the Sonoma County Regional Parks Department.

Creek Fronts and the Riverfront

Creek fronts and riverfronts help to define Petaluma character and culture and supply the community with important recreation opportunities. Trails along several of the city's creeks and the Petaluma River provide pedestrian and bicycling corridors that are also used as alternative transportation commuter routes. The Petaluma River, in particular, offers numerous recreation amenities and holds the possibility of offering more. The Petaluma River Trail, when fully implemented, would link residential and commercial uses along the riverfront and implementation of the Petaluma River Access and Enhancement Plan will further enhance the riverfront environment and its relationship to the surrounding community. The city offers approximately 216 acres of creek and riverfront recreation areas.

Community and Urban Separators

Urban Separators

The City of Petaluma has obtained title to 179 acres of urban separator lands adjacent to the Urban Growth Boundary. These urban separators serve as open space areas designed to buffer agricultural lands from urban lands as well as providing opportunities for recreation. In areas where an urban separator seems infeasible due to existing development or topography, an urban separator path provides a means to allow bicycle and pedestrian connections without requiring fee title dedication.

Table 3.3-6: Existing Urban Separators

Map Code	*Urban Separators*	*Estimated Acreage*
45	Cader Farms Highlands	10
46	Cross Creek	43
47	Graystone (contains Kenilworth Jr. High and Corona Creek playfields)	23
48	Heritage	8
49	Kingsmill	4
50	Mountain Valley (contains playfields)	7
51	Westridge Knolls	76
52	Southgate	4
53	Stratford Place	4
	Total Urban Separators	**179**

Community Separators

Community Separators in Sonoma County are intended to retain separate, identifiable cities and prevent corridor-style urbanization by preserving rural lands between developed areas. The Sonoma County General Plan 2020 Overview Draft identifies two community separators adjacent to Petaluma: Petaluma/Novato and Petaluma/Rohnert Park. The following is a detailed description of the community separators that surround the Petaluma UGB:

> *Petaluma/Novato.* These two communities are separated by approximately 2,755 acres of foothills, which are south of Petaluma, along the Highway 101 corridor. These open hillsides and ridgelines serve as a gateway between Marin and Sonoma Counties.
>
> *Petaluma/Rohnert Park.* Petaluma and Rohnert Park are separated by approximately 3,360 acres of farmland and foothills north of Petaluma, along the Highway 101 corridor. These open grassy areas provide a visual buffer between Petaluma and Cotati/Rohnert Park. The small foothills north of Petaluma, between Old Redwood Highway and Corona Road, divide Petaluma's urban development from the small, unincorporated Penngrove community.

Urban Centers

In addition to parkland, the City owns and operates other recreational and cultural facilities, which offer recreational and educational services as well as foster a sense of community identity and pride.[1] Key City-owned recreational and cultural facilities include:

1. These 24 acres of recreational and cultural facilities are not included in the total parks and open space acreage.

City Hall

Petaluma Community Center

Jack Cavanaugh Recreation Center

Petaluma Marina

Petaluma Historical Museum/Library

Polly Hannah Klaas Performing Arts Center

Petaluma Senior Center

Petaluma Adult/Senior Center

Service Standards

The City has adopted a citywide parks standard of 5 acres of parkland per 1,000 residents. With an existing population of approximately 57,698 residents as of January 2005 and a total of approximately 300 acres of parkland, Petaluma provides 5.2 acres of parkland per 1,000 residents, thus meeting their parkland standard.[2]

REGULATORY SETTING

The provision of parks and recreation services in the City of Petaluma and its Sphere of Influence is the responsibility of the City of Petaluma's Parks and Recreation Department. As part of the City's Subdivision Ordinance, the City requires the creation of Landscape Assessment Districts (LADs) as part of new subdivisions. In addition to General Plan policies, Petaluma has adopted the Petaluma River Access and Enhancement Plan to guide the creation of riparian corridor parkland within the city. These are described in more detail below.

Landscape Assessment Districts

Landscape Assessment Districts (LADs) are required by the City for all new residential subdivisions. The LADs fund the provision and maintenance of amenities on public lands within the subdivisions. Costs for the provision and maintenance of amenities are spread equally among all of the private parcels within each district. The City Council sets the annual assessments each July at a noticed public hearing.

2. The parkland standard was calculated using the existing 200 acres of community, neighborhood, and pocket parks as well as several urban separators (100 acres) for a total of approximately 300 acres included in calculating the existing parkland ratio of residents per 1,000 acres of parkland. Urban separators included in the acreage are those that provide some recreational amenities such as hiking trails and included Cader Farms Highlands, Graystone, Heritage/Landsdown, Kingsmill, Mountain Valley, Stratford, and a portion of the Cross Creek Airport Approach. Although there are several open spaces within the city that provide some passive recreational space, they were not included in the parkland standard calculations.

Petaluma River Access and Enhancement Plan

The 1996 Petaluma River Access and Enhancement Plan (the River Plan) describes the community's vision for the Petaluma River, including its riverfront uses, activities, and developments. The River Plan recognizes that the future economic, social, cultural and environmental health of the city is tied directly to the treatment of the river. It defines Petaluma as a river town and creates a regulatory framework intended to improve the relationships between the river and properties within the river corridor.

The River Plan provides a set of land use regulations and requirements. The regulations range from broad system-wide goals to site-specific programs. Public and private implementation measures are described, as well as guidelines for habitat management, mitigation, and design within the river corridor.

Incremental implementation of the River Plan has been underway since it was adopted nine years ago. Trail segments have been installed, land has been purchased as Riverfront open space, flood protection projects are nearing completion, habitat enhancements and restoration projects have been completed, new pedestrian improvements are nearing completion, riverfront properties have been developed, and funding for additional projects has been promised.

The River Plan has proven to be a flexible and effective tool for use by the City and property owners alike in achieving the goals set forth by the community. It is broadly supported and continues to define the long-range community vision for the Petaluma River.

IMPACT ANALYSIS

Significance Criteria

Impacts of the proposed General Plan would be significant if buildout resulted in:

> A shortage of parks facilities for new residents, by not meeting the General Plan standard of 5 acres of neighborhood and community parks per 1,000 residents; or
>
> Increase in the use of existing parks such that substantial physical deterioration of the facility would occur or be accelerated.

Methodology & Assumptions

This analysis considered existing and proposed General Plan policies, goals, and applicable regulations, as well as existing and proposed parks, open space, and recreation facilities within the city. Shortages or accelerated deterioration of park facilities were determined by dividing the projected resident population by the total existing and proposed acres of parkland as defined by the General Plan. It is assumed that a lower ratio of parkland per resident would increase park deterioration.

Summary of Impacts

With full implementation of the proposed General Plan, acres of parkland (including community and neighborhood parks) per 1,000 residents is maintained at a ratio of 5.3 acres of parkland per 1,000 residents. The proposed General Plan policies prevent the decrease in service levels resulting in increased deterioration of park facilities. Any physical impacts related to construction of new parks proposed in the General Plan are identified in the appropriate issue area discussion of this EIR.

Impacts and Mitigation Measures

Impact 3.3-1: Future development may result in a decrease of parkland per 1,000 residents. ***(Less than Significant)***

Currently, with a population of 57,085, Petaluma has an average of 5.2 acres of community and neighborhood parkland per 1,000 residents. Buildout of the proposed General Plan would result in the addition of approximately 15,600 residents. Without the provision of additional recreational facilities, this would result in an average of 4.12 acres of community and neighborhood parkland per 1,000 residents. In order to meet the established ratio of 5.0 acres of community and neighborhood parkland per 1,000 residents, Petaluma would need to add approximately 80 acres of additional parkland. New parkland that is proposed under the General Plan would total approximately 89 acres and would result in a parkland ratio of 5.3 acres of parkland per 1,000 residents. Part of the 89 acres would be provided per the City's dedication and in-lieu fee requirements, which the City is proposing to increase from 3.64 acres of parkland per 1,000 residents to 5.0 acres of parkland per 1,000 residents. Any additional acreage required to meet the City's standard of 5.0 acres of parkland per 1,000 residents would be provided through the continued use of partnerships, transfer of development rights, and other mechanisms (see the proposed General Plan policies listed below). Table 3.3-7 lists new parkland proposed under the General Plan. Table 3.3-8 summarizes park acreages at buildout of the General Plan.

Table 3.3-7: Parks Proposed Under the General Plan

Map Code	*Parks*	*Active*	*Passive*	*Estimated Acreage*
Proposed Community Parks				**66**
P-1	Steamer Landing (future phases)		x	20
P-2	Johnson Property	x		7
P-3	Pomeroy/Riverfront Site	x		7
P-4	East of Airport Site	x		25
P-5	Fairgrounds	x		7
Proposed Neighborhood Parks				**23**
P-6	Holmberg			4
P-7	UoP Property - Davidson Homes		x	3
P-8	Jessie Lane - Cobblestone Homes	x		3
P-9	Dutra Quarry		x	3
P-10	Petaluma Golf & Country Club		x	3
P-11	Former Kenilworth Site	x		2
P-12	Westridge Urban Separator Ball Field	x		3
P-13	Arroyo Park Expansion		x	2
Total New Parkland Under the General Plan				**89**

Table 3.3-8: Summary of Park Standards and Park Needs

	Population	*Citywide Standard (Acres/1,000 residents)*	*Total Acreage Required to Meet Standard*	*Acreage Provided*	*Parkland Ratio*
Existing Conditions (2005)	57,085	5.0	285	299	5.2
Future Buildout (2025)	72,707	5.0	363	388	5.3

Although not included in the calculations of future parkland standards, the City also recognizes the long-term development of two large regional parks: the 269-acre Lafferty Ranch located on Sonoma Mountain (P-15 on Figure 3.3-1) and the 1,737-acre Tolay Lake Park, located outside of the Planning Referral Area but just southeast of Petaluma (P-14 on Figure 3.3-1). The City would also add up to 6 acres of urban separator adjacent to the Santa Rosa Junior College (P-16 on Figure 3.3-1).

Maintaining the standard of 5 acres of parkland per 1,000 residents ensures that buildout of the proposed General Plan would not result in deterioration of recreational facilities.

Proposed General Plan Policies that Reduce the Impact

6-P-1 Develop additional parkland in the city, particularly in areas lacking these facilities and where new growth is proposed, to meet the standards of required park acreage.

A. Develop and implement a Parks Master Plan.

B. Work with local, regional, and state agencies to acquire and fund further parkland acquisition and improvements.

C. Undertake a proactive program to acquire necessary land and develop new parks in the locations shown in Figure 6-1, prioritizing areas where new development may occur and park opportunities may be lost, and in underserved neighborhoods.

D. As part of the City's Development regulations establish common open space requirements for multi-family development. Such open space shall NOT to be counted toward public park dedication/in lieu fee requirements.

E. Require land development along designated trails and pathway corridors to provide sufficient right-of-way and to ensure that adjacent new development does not detract from the scenic and aesthetic qualities of the corridor.

F. Encourage and support the use of public land for community gardens.

6-P-2 Provide a comprehensive and integrated network of parks and open space and improve access to existing facilities where feasible.

A. Provide public access and recreational opportunities along the length of the Petaluma River and its tributaries, to every extent possible.

6-P-3 Proposed parks, and proposed expansion of existing parks, as designated on the General Plan Land Use Map, are parcel specific, and shall be dedicated as a condition of development entitlements.

6-P-5 Maintain a park standard of 5 acres per 1,000 residents, in order to enhance the physical environment of the city and to meet the recreation needs of the community

A. Revise the City's park in lieu fees/dedication requirements to match the General Plan standard of 5 acres per 1,000 residents.

6-P-6 Neighborhood parks are donated, constructed, and maintained within the developing property(ies). In addition to the donation and improvements, park impact fees shall be paid to offset costs associated with developing, upgrading, and maintaining community parks. Transfer of density from the donated park acreage may be considered where deemed appropriated by the City Council.

A. Revise the City's Municipal Code to require dedication of neighborhood park land, and construction of associated neighborhood park improvements, in addition to the payment of park impact fees, eliminating the reimbursement component for neighborhood parks.

B. Establish a transfer of development rights (TDR) program that allows project proponents on whose sites new parkland locations are designated, to transfer development rights from portions of the site dedicated as public open space/park beyond required dedication/in lieu requirements (5 acres per 1,000 residents) to the remainder of the site at a ratio of 1.5 x base land use designation on the site, subject to approval by the City Council and provided the following criteria are met:

The resulting park area meets the minimum size and location requirements shown in Table 6.1-8 and Figure 6-1;

The park/open space is useful for recreational use, and not just leftover acreage;

The park/open space is physically and perceptually available to the community-at-large, and not internal to the development;

The resulting transfer will not unduly impact the character of the neighborhood where the development is located; and

The park/open space is not at the city's edge, adjacent to an urban separator.

6-P-9 Continue to coordinate joint use of school properties as neighborhood parks and recreation program sites with school districts, which will help meet the community's demand for additional recreational facilities while realizing the cost benefits from the shared use of publicly-owned land.

6-P-12 Maintain the existing Petaluma Swim Center and Skate Park until new, comparable sites are identified, acquired and construction funding secured for these uses.

6-P-13 Work with the Sonoma County Regional Parks Department to encourage the development of Tolay Lake and Lafferty Ranch as an open space and passive use assets for the residents of Petaluma and southern Sonoma County.

6-P-14 Work with the Sonoma County Regional Park Department, the Sonoma County Open Space Authority, the Sonoma County Agricultural Preservation and Open Space District, the Sonoma County Water Agency, the Sonoma Land Trust, the Sonoma County Watershed Council, the California State Parks Department, and the California State Coastal Conservancy to develop common goals for open space beyond the Urban Growth Boundary, and coordinate acquisition efforts and priorities.

6-P-15 Should expansion beyond the 1998 Urban Growth Boundary occur, priority shall be given to identification and development of adequate park lands to meet identified standards and community needs.

6-P-16 The City shall work with citizens, businesses, schools, organizations, and public agencies to fund an acceptable level of maintenance for all city-owned park and recreational facilities.

A. Create opportunities and incentives, such as public acknowledgements plaques and signs, for other agencies, non-profits, private businesses, and user groups to participate in the provision, development and maintenance of parks, open space, and recreation facilities.

B. Establish a program to work with adjacent neighborhoods to take responsibility for their neighborhood parks and urban separators, including the possibility of assuming maintenance needs or costs. Neighborhood parks 'adopted' by the residents shall remain publicly owned and accessible by the community.

6-P-17 Development that occurs adjacent to designated trails and pathway corridors shall be required to install and maintain the publicly owned and accessible trail, in perpetuity.

Mitigation Measures

No additional mitigation measures are required.

3.4 PUBLIC SERVICES

This section presents the environmental setting and impact analysis for public services and safety resources in Petaluma. The public services analyzed in this EIR include police and fire protection, emergency response, and schools.

ENVIRONMENTAL SETTING

Physical Setting

Schools

The City of Petaluma contains elementary and junior high and high school facilities to serve local residents, as well as the Petaluma campus of the Santa Rosa Junior College and the Petaluma campus of the University of Northern California.

The City of Petaluma is served by four elementary school districts, Cinnabar, Old Adobe (OASD), Petaluma City (PCESD), and Waugh, which operate a total of 17 elementary schools (K-6). All of the city's 10 secondary schools belong to the Petaluma Joint Union High School District (PJUHSD), which serves populations both within and outside of the city limits. PJUHSD and PCESD operate under one umbrella agency called Petaluma City Schools (PCS). Within the city limits, PCS runs eight elementary schools, including two charter schools and one alternative school, two junior high schools (7-8), one community day school for grades seven and eight, six high schools (9-12), including three small continuation schools and one alternative school. PCS is also responsible for the functions of the Petaluma Adult School, which served approximately 2,826 residents in 2004 through basic education and fee based classes. Although PCS operates the majority of the schools in Petaluma, OASD operates an additional five elementary schools (one, Old Adobe, is located outside of the city, but serves city students), the Waugh School District operates two, and the Cinnabar School District operates one.

Petaluma is also home to two private elementary schools and one private high school, including St. Vincent de Paul Elementary and High Schools, Petaluma Christian Academy, and Petaluma Valley Day School. Charter schools include the Live Oak Charter School (K-3) and the Petaluma Charter School (K-8).

Jurisdictional Boundaries

The boundaries of the PJUHSD and the elementary school districts do not align with Petaluma's city limit line or Urban Growth Boundary (UGB). The PJUHSD encompasses an area significantly larger than the area than the city limits and serves high school students residing both in the City of Petaluma and in the surrounding areas. Similarly, the elementary school districts boundaries do not coincide with Petaluma's city boundaries. With the exception of PCESD, the elementary school districts that serve Petaluma serve small, localized areas that often straddle other jurisdictional boundaries (see Figure 3.4-1).

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Fig. 3.4-1

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Existing Enrollment and Capacity

Tables 3.4-1 and 3.4-2 summarize the existing enrollments and capacities for Petaluma's public elementary and secondary schools. In the 2004-2005 school year, 5,329 students were enrolled in public elementary schools located within Petaluma's city limits. This enrollment utilized 86 percent of the enrollment capacity available in Petaluma's public elementary schools.

Table 3.4-1 : Existing Public Elementary School Enrollment and Capacity (K-6)

Schools	*Enrollment 2004-2005*	*Existing Capacity*	*Percentage of Capacity 2004-2005*
Petaluma City Elementary School District	*2,092*	*2,465*	*85%*
Grant	345	376	92%
Live Oak Charter School	130	220	59%
Mary Collins at Cherry Valley Charter School	289	307	94%
McDowell	322	401	80%
McKinley	272	328	83%
McNear	355	395	90%
Valley Oaks (alternative)	6	30	20%
Valley Vista	373	408	91%
Old Adobe Union School District	*1,909*	*2,165*	*88%*
Bernard Eldredge	337	450	75%
La Tercera	399	485	82%
Miwok Valley	489	510	96%
Old Adobe[1]	266	280	95%
Sonoma Mountain	418	440	95%
Waugh School District	*881*	*950*	*93%*
Corona Creek	430	475	91%
Meadow	451	475	95%
Cinnabar School District	*232*	*325*	*71%*
Cinnabar[1]	232	325	71%
Wilmar Union School District	*215*	*310*	*69%*
Wilson[1]	215	310	69%
Total Elementary School Enrollment/Capacity	**5,329**	**6,215**	**86%**

1. The school is located outside of city limits, but it serves city residents.

Source: California Department of Education; City of Petaluma, General Plan 2000-2020: Education Services Response Forms (memo dated May 6, 2002); Dyett & Bhatia.

Table 3.4-2: Existing Public Secondary School Enrollment and Capacity (7-12)

	Enrollment 2004-2005	*Existing Capacity*	*Percentage of Capacity 2004-2005*
Petaluma City Unified School District	5,663	5,791	98%
Carpe Diem High School (continuation)	31	31	100%
Casa Grande High School	1,809	1,834	99%
Crossroads Community Day School (7-8)	8	15	53%
Kenilworth Junior High School	1,045	1,060	99%
Mary Collins at Cherry Valley Charter School (7-8)	41	42	98%
Petaluma High School	1,628	1,618	101%
Petaluma Junior High School (7-8)	811	884	92%
San Antonio High School (continuation)	155	155	100%
Sonoma Mountain High School (continuation)	32	32	100%
Valley Oaks High School (alternative)	103	120	86%
Secondary Schools (7-12)	5,663	5,791	98%

Source: California Department of Education; City of Petaluma, General Plan 2000-2020: Education Services Response Forms (memo dated May 6, 2002); Dyett & Bhatia.

PJUHSD's secondary school facilities were at 98% capacity during the 2004-2005 school year with a district-wide enrollment of 5,663 students. Recent capacity increases, including the provision of rented portable classrooms, at several of the school sites ensured that capacity exceeded enrollment needs. The PJUHSD intends to replace all temporary structures with permanent facilities in the near future (Steve Bolman, Pers. Comm., 2005).

Police Services

The Petaluma Police Department (PPD) provides police services to the City of Petaluma. According to the Police Department, the PPD is composed of 95 full-time employees, including the Chief, 1 Captain, three Lieutenants, 11 Sergeants, 53 Officers, 5 Community Service Officers, 2 Parking Enforcement Officers, and other support staff. Additionally, the Department has D.A.R.E Officers, School Resource Officers, a Traffic Unit with a Serious Traffic Offender Program (S.T.O.P), an Evidence Technician Unit, a K-9 Unit, Bicycle and Motorcycle Patrol, a SWAT Team, a Hostage Negotiation Team, Gang Enforcement and Street Crimes Units, an Investigation Unit, and a volunteer Reserve Community Service Officer Program (City of Petaluma Website, 2005). The main police station is located at 969 Petaluma Boulevard North.

An additional substation, located in a storefront at 363 South McDowell Boulevard, was closed in June 2006. Expansion or relocation of the Police Department is being investigated.

In 2005, with a total population of 57,085 and a total of 74 police officers (including Sergeants, Lieutenants, the Captain, and the Chief) Petaluma had a service ratio of 1.3 officers per 1,000 residents. This is above the current nationally accepted standard service ratio of 1.25 officers per 1,000 residents, but falls short of the California standard, which ranges from 1.4 to 1.7 officers per 1,000 residents. Responses by the police to calls are prioritized by urgency. For Priority 1 calls, which include emergency and potentially life threatening calls, the PPD also has a recommended emergency response time of three minutes.

The PPD is developing new software solutions to improve police services. A Computer Aided Dispatch System (CAD) and a Records Management System (RMS) were implemented in 2002/2003 to help keep the Police Department current and functioning at a high level of service. The CAD/RMS project is a Country-wide public safety dispatch and records management system. These systems allow database information to be available to officers in the field, provide more accurate statistical information, and automate dispatches.

Fire Protection

The Petaluma Fire Department (PFD) provides fire, rescue, and emergency medical services to people within the city limits as well as to a 160-square-mile area of Sonoma County surrounding the city. The PFD responds to structural and wild fires, emergency medical service, and hazardous/toxic spills in the City of Petaluma.

As of 2005, the PFD had a total of 57 employees on staff, providing service from the following locations:

Station 1 – Fire Administration (198 D Street)

Station 2 – Training Facility (1001 N. McDowell Boulevard)

Station 3 (831 S. McDowell Boulevard)

Fire Prevention Office (City Hall/22 Bassett Street)

The D Street station will be replaced by new headquarters on Petaluma Boulevard South. The new station, to be completed by July 2008, is expected to house sleeping quarters, administrative offices, a radio dispatch center, as well as accommodations for female firefighters. Since the new headquarters site is 550 feet from the current headquarters, it is expected that firefighters will still be able to respond to emergencies within the current/standard response time. Currently, the department's average response time to emergencies is less than five minutes, which is within the department's response time goals. Boundaries of the Fire Department's response times are illustrated on Figure 3.4-2.

Emergency Response

Mitigation planning is an effective method of reducing risk to life and property from natural disasters such as earthquakes or wildfires. The PFD is the main contact and conduit for disaster preparedness information to all City departments, schools, and citizens. The PFD provides representatives to the Office of Emergency Services Coordinators and the South Sonoma County

Disaster Task Force meetings. The Emergency Operations Center (EOC) is activated during extraordinary emergencies and disasters, such as flooding. The Emergency Staff is made up of City personnel who act as Section Chiefs and are supported by City staff. The primary duties are to plan and coordinate all response and recovery operations utilizing the Incident Command System.

REGULATORY SETTING

The provision of public services and safety services in the City of Petaluma and its Sphere of Influence is the responsibility of several local, regional, and state agencies.

Public education in Petaluma is primarily administered by the Petaluma City School District and the Petaluma Joint Union High School District. Other school districts governing public elementary education in Petaluma include the Waugh School District, Cinnabar School District and Old Adobe School District.

IMPACT ANALYSIS

Significance Criteria

A significant impact would occur with full implementation of the proposed General Plan if the following negative impacts occur to level of service standards for schools, police and fire, and emergency response services:

Student levels in schools exceed available or planned school capacity;

Demand for police or fire services exceeds standards mandated by General Plan performance standards; or

Need for emergency preparedness increases above the capacity of existing programs.

Methodology & Assumptions

This analysis considered current and proposed General Plan policies and goals, existing and proposed public and safety services within the city, and applicable regulations and guidelines.

Schools

Future demographic trends are more accurately projected when the calculations are performed closer to the horizon date with the most current data. For this reason, school districts in Petaluma do not project enrollment further than 10 years into the future. For the purposes of the General Plan, 20 year enrollment projections are required in order to illustrate the broad trends that may occur during the Plan's implementation period.

To calculate future elementary school enrollment in Petaluma, the percentage of the population enrolled in public elementary schools in Sonoma County in 2025, as projected by the Department of Finance (DOF), was applied to Petaluma's 2025 General Plan buildout population. The resulting number was then distributed among the elementary schools to indicate the approximate enrollment, by district, proportionate to the amount of development that could occur in each district under General Plan buildout.

Figure 3.4-2: Fire Response Radii

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The jurisdictional boundary conflict between the City and the PJUHSD means that future public secondary school enrollment projections require consideration of the population served by the entire district. Data from the 2000 US Census was used to determine the 2000 population within the area served by the district. The Sonoma County population growth rate calculated with DOF data for the time period 2005-2025 were applied to the 2000 district population to obtain population estimates for 2025. The percentage of the population enrolled in public secondary schools in Sonoma County in 2025, as projected by the DOF, was then applied to district's 2005 and 2025 population projections in order to determine the approximate enrollment for those years.

Police Services

To ensure that new development does not adversely affect the City's current ability to provide police services, the total projected population under the proposed General Plan at buildout, 72,707 residents, is divided by 1,000 and then multiplied by 1.3 to calculate the number of total police officers necessary to maintain the existing ratio of 1.3 officers per 1,000 residents.

Fire Services

To evaluate potential impacts on the fire facilities and services, an analysis was done using 1.5 mile radii around existing fire stations in order to calculate the percentage of land within the UGB that is located outside of the four minute standard around these fire station areas. In addition, to ensure that new development does not adversely affect the City's current ability to provide fire services, the total projected population under the proposed General Plan at buildout, 72,707 residents, is divided by 1,000 to calculate the number of total firefighters necessary to maintain the proposed General Plan ratio of 1 firefighter per 1,000 residents.

The analysis of emergency response is based on information provided by the City of Petaluma, the proposed General Plan, and applicable regulations and guidelines.

Summary of Impacts

The population growth that is expected under the proposed General Plan would include a small increase in enrollment within the OASD and the PCUSD. While the increased enrollment would exceed existing capacity within these school districts, this would not result in the need for new school facilities because enrollment projections for the other elementary school districts within Petaluma's UGB would decline, and elementary students could be redistributed to alleviate enrollment limitations within the OASD and PCUSD. Enrollment projections for Petaluma's secondary school system, the Petaluma Joint Unified High School District, are expected to decline substantially during the years covered by the proposed General Plan.

The proposed General Plan's policies require that new development coordinate and plan for additional police and fire facilities to prevent adverse significant impacts on existing safety and emergency preparedness levels.

Impacts and Mitigation Measures

Impact 3.4-1 New development may generate additional elementary and secondary school enrollment within all the school districts serving Petaluma. (Less than Significant)

Based on the General Plan buildout population, PJUHSD projections, and Sonoma County grade-level enrollment projections, an overall increased enrollment is expected among Petaluma-serving elementary schools while secondary schools within the PJUHSD are projected to experience a drop in total enrollment.

Future Elementary and Secondary Enrollment

As shown in Table 3.4-3, the overall enrollment in public elementary schools would increase. However, the projected enrollment would not exceed the existing capacity of the public elementary schools located within the city limits. Overall, the projected enrollment for public elementary schools would decline and would utilize 93.9 percent of current capacity. However, elementary enrollment at the PCUSD is projected to exceed current capacity by a small number (175 students); capacity enhancement toward the end-life of the proposed General Plan, or alternatively, arrangement with other school districts experiencing decreasing enrollment might be needed for the PCUSD. Additionally, while overall elementary school capacity is unlikely to be exceeded during the life of the proposed General Plan, schools located in areas where growth is anticipated may experience capacity limitations. These limitations could be mitigated through redistribution of enrollment among elementary schools throughout the city.

Table 3.4-3: Estimated Public Elementary and Secondary School Enrollment (2005 and 2025)

	Current Enrollment (2004-05)	*Estimated Buildout Enrollment*	*Current Capacity (2004-05)*	*Estimated Change (2005–Buildout)*
Total Elementary (K-6)	5,329	5,281[1]	6,215	-48
Cinnabar School District	232	166	325	-66
Old Adobe Union School District	1,909	2,041	2,165	132
Petaluma City Unified School District[2]	2,092	2,640	2,465	548
Waugh School District	881	422	950	-459
Wilmar Union Elementary	215	12	310	-203
Total Secondary (7-12)	5,663	4,814	5,791	-849
Petaluma Joint Union High School District	5,663	4,814[3]	5,791	-849

1. Enrollment resulting from 2025 population within UGB. Population age structure in Petaluma in 2025 assumed to correspond to Sonoma County age structure, as projected by California Department of Finance. Future estimates for elementary enrollment within the UGB calculated by multiplying the Petaluma 2025 elementary-age population by the percent of elementary school age residents enrolled in public school in Sonoma County in 2004-2005, as reported by the California Department of Education. For further details, see Petaluma General Plan Draft EIR.
2. Does not include Penngrove Elementary School.
3. Enrollment estimates for all areas served by the PJUHSD (including outside the Petaluma UGB), calculated by multiplying the estimated 2025 population served by the PJUHSD by the percent of secondary school age residents enrolled in public school in Sonoma County in 2004 -2005 as reported by the California Department of Education. The 2025 PJUHSD population was calculated by projecting US Census 2000 data using demographic trends forecasted for Sonoma County by the California Department of Finance.

Source: CBEDS 2004-2005 Enrollment by Grade and School for schools in Petaluma (California Department of Education); City of Petaluma, General Plan 2000-2020: Education Response Forms ECT; Dyett & Bhatia.

While the population in Sonoma County and Petaluma is projected to increase, an aging population is causing a shift in composition, producing strikingly differing results for enrollment at various levels. Based on General Plan buildout population, Sonoma County age class projections and grade-level enrollment projections, elementary school enrollment is expected to actually decline slightly by 2025. As shown in Table 3.4-3, however, enrollment will slightly increase in two school districts where new growth is projected (Petaluma and Old Adobe), and decline in others where growth will be limited (Cinnabar, Waugh, and Wilmar). The projected 2025 public elementary school enrollment would utilize 85 percent of the total 2004-2005 capacity of elementary schools located within and near the city boundaries.

Because the PJUHSD serves an area much larger than the city, future public secondary school enrollment projections require consideration of the entire population served by the district instead of just the population within Petaluma. Based on US Census 2000 population data for the area served by the district, Sonoma County population projections, and grade-level enrollment projections, a significant decline (15 percent) in public secondary school enrollment is expected during the years covered by the General Plan. Petaluma City Schools anticipates the decline in enrollment to begin in the 2006-2007 school year and to be similar in pattern to the enrollment

decline experienced by school districts in Petaluma in the late 1970s and 1980s. Public secondary school enrollment estimates are shown in Table 3.4-3.

PCS and the other Petaluma school districts do not have projections that extend across the time period covered by the proposed General Plan. It is widely accepted that enrollment projections should be re-evaluated as more reliable demographic trends and data become available. The 20-year projections presented here have been conducted to provide a broad estimate of future enrollment trends in Petaluma to evaluate need for additional facilities. New projections should be conducted periodically to ensure needs are anticipated and met. In addition to period enrollment projections, the proposed General Plan contains policies to reduce impacts to the schools under the proposed General Plan to less than significant.

Proposed General Plan Policies that Reduce the Impact

7-P-12 Work with school districts to ensure availability of appropriate sites for all schools needs and to identify alternative short or long term uses for school facilities and sites that may not be needed because of decreased enrollment.

A. Work with the Petaluma school districts to undertake a comprehensive, long-range (10–20 years) assessment of enrollment, school sites, and capacities.

7-P-16 Should expansion of the UGB occur a priority shall be given to analyzing whether new school sites are needed and shall be preserved for future school development.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.4-2 New development under the proposed General Plan requires police and fire protection that exceeds current staffing and facilities. (Less than Significant)

Current police and fire protection is designed to meet the needs of the existing population and employment base. New development from the General Plan will add approximately 15,600 new residents and 13,380 jobs to the city, increasing the long-term demand for police assistance and emergency fire response.

In order to ensure that new development does not adversely affect existing police services, the Petaluma Police Department will need to hire new police officers in order to maintain the current ratio of 1.3 officers per 1,000 residents. To maintain the existing ratio and accommodate an additional 15,600 new residents, it will be necessary to hire an additional 21 police officers. Table 3.4-4 demonstrates the additional police officers needed for buildout.

Table 3.4-4: Additional Police Officers Needed for Buildout

	Population	*Officers*	*Ratio*
2005	57,085	74	1.3
2025	72,707	95	1.3
Difference	15,622	21	

Source: Dyett and Bhatia, 2006.

Currently, more than 90 percent of Petaluma residents are located within 1.5 miles of a fire department station with small segments of the South Hills, West Hills, and North East residential neighborhoods lying outside of the 1.5 mile radii. The proposed General Plan does not propose any new development outside of the UGB; therefore, the service area for Petaluma's fire department will not increase. A Standards of Coverage study was completed in 2003, to determine the appropriate number of fire stations and their optimum locations for potential buildout within the UGB. The Study determined that the current number and location of fire stations was adequate for meeting Petaluma's needs.

However, new development under the proposed General Plan could increase traffic congestion, which would reduce response times. To ensure that new development does not adversely affect the City's fire facilities, the proposed General Plan contains policies that require the City to maintain and modernize police and fire stations as needed to accommodate growth. The policies also require properties that are outside of the four-minute response radii to utilize fire-resistant materials and maintain fire breaks between surrounding buildings. It is difficult to determine the impact of additional residential and non-residential development on fire protection response times, since response times are dependent on traffic conditions and street layouts. As a result, response times are often projected on a project specific level. Additional fire protection officers may need to be trained and protection equipment purchased as development proceeds. The need for an additional fire training facility may also be necessary as growth progresses.

In addition, in order to ensure that new development does not adversely affect existing fire services, the Petaluma Fire Department will need to hire new firefighters in order to maintain the current ratio of 1 firefighter per 1,000 residents. To maintain the existing ratio and accommodate an additional 15,600 new residents, it will be necessary to hire an additional 16 firefighters. Table 3.4-5 demonstrates the additional firefighters needed for buildout.

Table 3.4-5: Additional Firefighters Needed for Buildout

	Population	*Firefighters*	*Ratio*
2005	57,085	57	1.0
2025	72,707	73	1.0
Difference	15,622	16	

Source: Dyett and Bhatia, 2006.

Proposed General Plan Policies that Reduce the Impact

7-P-17 Achieve and maintain a minimum ratio of one fire suppression personnel per 1,000 population served.

A. Fund additional staff to insure minimum ratio is maintained as population increases occur.

7-P-18 Ensure facilities, equipment and personnel are adequate to maintain quality of service demands of the community, including but not limited to: fire suppression, Advanced Life Support (ALS), rescue, fire prevention, education, CUPA, and disaster preparedness and management.

A. Expand Fire staffing to provide a Training Officer and Emergency Medical Services (EMS) Manager to insure maintaining compliance to Federal and State safety mandates.

B. Continue education and training programs to maintain technical proficiency.

C. Maintain and modernize emergency response facilities, including fire stations, as needed to accommodate population growth.

D. Expand, as needed, staffing in the Fire Prevention Bureau to keep pace with increasing development and fire safety inspection impacts.

E. Maintain safety department responsiveness to changes in community demographics (i.e. age, ethnicity).

F. Retain a current computed-based records management system to allow monitoring and evaluation of program performance.

7-P-19 Maintain a four minute travel time for a total of 6-minute response time for emergencies within the City.

A. Require that properties outside of the four-minute (travel) response radii utilize fire-resistant materials and maintain fire breaks surrounding residences.

B. Ensure that transportation improvements are provided for additional development so as not to adversely impact emergency response times.

7-P-21 Maintain and expand the Ambulance Enterprise System to meet continued needs in the District.

A. Provide a third ALS ambulance within the Petaluma Fire Department.

B. Establish and implement an ambulance replacement program.

C. Maintain current EMS training to meet industry standards.

7-P-25 Reduce the potential for a catastrophic fire event in the historic Downtown area.

A. Complete the fire sprinkler retrofit installation within the historic Downtown business area.

B. Maintain and update the business fire safety inspections and pre-incident planning documents (Pre-Plans).

7-P-31 Maintain a minimum standard of 1.3 police officers per 1000 population.

A. Consider funding additional staff to ensure the minimum ratio is maintained as the population increases.

7-P-32 Develop and use the City's Computer Aided Dispatch System (CAD) and Records Management System (RMS) for analysis of issues, crime trends and response times.

7-P-33 Pursue a long-term strategy for funding education and crime prevention programs recognizing that the costs of education and prevention are more effective in reducing crime than the costs of apprehending, prosecuting and incarcerating criminals.

7-P-34 Plan for expanding or replacing the police station with a facility of sufficient size to accommodate police operations, community requirements and the anticipated population growth.

7-P-35 Incorporate into new development, to the extent deemed appropriate and feasible, the Development Code Urban Design Standards for crime prevention.

7-P-36 Ensure adequate police staff to provide rapid and timely response to all emergencies and maintain the capability to have minimum average response times. Actions that could be taken to ensure rapid and timely response to all emergencies include:

A. Analyze and monitor factors affecting response time (population growth, police staffing, and community policing programs) and average response times as guidelines based on past experience.

B. Maintain, train, and equip special response teams for extraordinary or extremely hazardous emergency incidents.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.4-3 New development under the proposed General Plan requires emergency preparedness that may exceed the capabilities of the existing programs. (Less than Significant)

Additional population and employment under the General Plan would potentially require additional emergency preparations such as staffing, facilities, equipment, or supplies, in the event of an earthquake or other disaster.

Proposed General Plan Policies that Reduce the Impact

7-P-22 Ensure emergency response equipment and personnel training are adequate to follow the procedures contained within the Emergency Operations Plan for a major event, through maintaining and updating, as appropriate, the City's emergency preparedness programs, plans, and procedures to ensure the health and safety of the community in the event of an earthquake or other disaster.

A. Review and update City department Disaster Operation Guides (DOGs) as needed.

B. Provide training to all City personnel to remain current with all State and Federal mandated training for disaster preparedness (i.e. NIMS).

C. Conduct training exercises for city personnel to simulate man-made or natural disasters.

D. Consider the need, and fiscal feasibility, of providing a dedicated Disaster Coordinator.

E. The Fire Department should provide the training and organization for community based volunteers who can provide localized assistance within their neighborhoods during an emergency.

7-P-23 Continue to utilize the Emergency Operations Center (EOC) to provide early warning of and response to all life-threatening hazards, such as earthquakes, floods, landslides, severe storms, and hazardous materials incidents.

A. Evaluate the effectiveness of the EOC facility and consider relocation to other city facilities to improve emergency operations and coordination.

7-P-24 Ensure that critical facilities, including medical centers, school facilities, and other structures that are important to protecting health and safety in the community, remain operative during emergencies.

A. Work with local hospitals and school districts to coordinate planning, communication and response.

7-P-28 Expand the capability of the Fire Department to respond to River related emergencies.

A. With revitalization of the Downtown and the Petaluma River corridor, along with increased river activities, purchase a new rescue/fire boat and relocate it on the River for better response times and increased opportunities for emergency response.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.4-4 Development near the Urban Growth Boundary may increase risk from wild land fires due to the proximity of development to open areas of grassland or chaparral.

The residential construction proposed by the General Plan will result in an increased hazard from wild land fire. Development proposed under the General Plan could result in construction adjacent to open areas and slopes covered with tall grasses and/or chaparral. This risk is particularly high in the western and southern regions of the City where development is proposed adjacent to open space areas and where some of these areas lay outside the PFD's four minute response radii.

Proposed General Plan Policies that Reduce the Impact

In addition to the policies list above, the following policy will mitigate Impact 3.4-4:

7-P-19 Maintain a four minute travel time for a total of 6-minute response time for emergencies within the City.

A. Require that properties outside of the four-minute (travel) response radii utilize fire-resistant materials and maintain fire breaks surrounding residences.

B. Ensure that transportation improvements are provided for additional development so as not to adversely impact emergency response times.

3.5 PUBLIC UTILITIES AND ENERGY

This section describes the current water supply, wastewater treatment, energy utilities, and solid waste programs for the City of Petaluma as well as the potential impacts associated with the adoption of the proposed General Plan.

ENVIRONMENTAL SETTING

Physical Setting

The following sections describe the existing services and facilities for water supply, wastewater treatment, energy and solid waste within the City of Petaluma.

Water Supply

Petaluma's primary source of water continues to be Russian River water purchased from the Sonoma County Water Agency (SCWA). The SCWA supplies water to Petaluma and seven other water contractors under the 11th Amended Agreement for Water Supply between SCWA and its water contractors. Under the 11th Amended Agreement, Petaluma's monthly water supply entitlement from the SCWA is an average-day peak month supply of 21.8 million gallons per day (mgd) and an annual supply limit of 13,400 acre-feet per year (4,363 million gallons)[1]. The City supplies approximately 68% residential and 32% non-residential customers, which include commercial, institutional, and industrial customers. In the baseline year of 2002, the City delivered more than 3,600 million gallons (11,000 acre-feet) of potable water to Petaluma's residents and businesses.

The major water distribution facilities owned and operated by the City consist of approximately 200 miles of pipeline, ten treated water reservoirs that provide 13 million gallons of storage, and eight booster pump stations. The City's existing water distribution system is divided into five pressure zones. Zones 1, 2, and 4 are supplied by turnouts along the Petaluma Aqueduct. The higher elevation areas which comprise Zones 3 and 5 are supplied by booster stations that draw water from Zone 2. The City maintains a groundwater supply system that is reserved for standby or emergency situations, or to provide peak day demands that cannot be met through SCWA water. Historical water production from City wells, from 1959 through 2002 can be found in Appendix F-2, Groundwater Feasibility Study. For the purpose of identifying a baseline of groundwater use, a 20 year period was utilized (1982 – 2002), comparable to a General Plan lifespan, and to allow for periods of drought and significant rainfall seasons.

Petaluma's water conservation program, established in 1998, has been and continues to be effective in promoting permanent water savings. The program now accounts for approximately 66 million gallons of potable water savings each year, primarily through implementation of the California Water Urban Conservation Council's Best Management Practices.

1. Annual entitlement limits were not included in the water supply agreements prior to the 11th Amended Agreement.

Russian River Water System

Three major reservoir projects provide water supply storage for the Russian River Watershed: Lake Pillsbury on the Eel River, Lake Mendocino on the East Fork Russian River, and Lake Sonoma on Dry Creek. Most of the water supply is provided by Lake Mendocino and Lake Sonoma that have a water supply pool capacity of 72,000 acre-feet (23,460 million gallons) and 245,000 acre-feet (79,830 million gallons), respectively, for a total water supply capacity of 317,000 acre-feet (103,300 million gallons)[2].

The SCWA controls water supply releases from Lake Sonoma and Lake Mendocino. Water released from these reservoirs enters Dry Creek and East Fork Russian River, respectively, and flows downstream to the Mirabel and Wohler areas of the Russian River, near Forestville, where it is diverted into the Agency's water transmission system by six Ranney collectors that draw water from the aquifer below the Russian River. During periods of low flow the Agency utilizes infiltration ponds around the collectors and an inflatable dam on the Russian River to assist in raising the water level. The collectors pump the water into the transmission system, which includes 17 steel water storage tanks with a storage capacity of 128.8 million gallons and 85 miles of pipelines (aqueducts).[3] The Agency supplements Russian River water with three groundwater wells; an increase in well production is not anticipated under the proposed General Plan.

Groundwater

In 2006, the City had six active wells and nine inactive wells. Groundwater will serve as an emergency water supply if SCWA deliveries are curtailed. All City wells are operating and maintained in good working order by the City of Petaluma Department of Water Resources and Conservation in accordance with State Health and Safety regulations. The City intends to use groundwater primarily for standby or emergency conditions and will meet all normal demands from surface water (SCWA), recycled water, and conservation in the near term (Dodson Engineers, 2006). The City's intent is to be able to provide minimum month average day demands from its well supply as a short-term emergency source of water in the event of a loss of the SCWA supply. Following past practices, groundwater use may be utilized during the planning period to meet peak water demands in the summer months (see historical use, Groundwater Feasibility Study, Technical Appendix F-2).

In the last two years of the planning period in years 2024 and 2025, the water supply presently available to the City from SCWA, in combination with recycled water and water conservation may not be sufficient to meet annual or maximum month demands. Assuming that no additional supply from SCWA is secured before 2024, the shortfall is estimated at 186 acre-feet per year. The shortfall of 186 acre-feet could be met by pumping approximately four of the City's existing wells at an average of 0.5 mgd over the course of four summer months. This level of pumping is far less than the wells' capacities and significantly below historic groundwater pumping levels for these wells. The existing groundwater basin is identified and studied in the Groundwater Feasibility Study (Feb 2004), incorporated herein as Appendix F-2 (Volume 4).

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2. Page 4, SCWA Water Supply Workshop Report (November 1, 2004).

3. Page 5, SCWA Water Supply Workshop Report (November 1, 2004).

Water Distribution System

The Water Distribution System Master Plan is identified and analyzed within the Water Distribution System Master Plan (July 2006), incorporated herein as Appendix D (Volume 3). The water distribution system is divided into 5 pressure zones that are established to provide acceptable pressures across the system. The major water distribution facilities consist of six active SCWA aqueduct turnouts, eleven treated water reservoirs with a nominal capacity of 13 million gallons (mg), eight booster pump stations with a system total of 22 pumps, and a network of distribution pipelines.

Water Conservation

The City's water conservation program focuses on thirteen best management practices (BMPs) or water demand management measures. The City utilizes water conservation BMPs as a method to reduce water demands, thereby reducing water supply need for the City.

The City is a member of the California Urban Water Conservation Council (CUWCC). The CUWCC was created to assist in increasing water conservation statewide, under a Memorandum of Understanding (MOU). As signatory to the MOU, the City has pledged their good faith effort towards implementing BMPs identified in the CUWCC MOU regarding urban water conservation. The City signed the CUWCC MOU on January 31, 2002, and submits annual BMP reports to the CUWCC in accordance with the MOU. The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the utility may request an economic exemption for the BMP. The City has not requested economic exemption from any of the BMPs at this time.

Table 3.5-1: City Water Conservation Best Management Practices (BMP)[1]

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers
BMP 02: Residential Plumbing Retrofit
BMP 03: System Water Audits, Leak Detection, and Repair
BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing
BMP 05: Large Landscape Conservation Programs and Incentives
BMP 06: High-Efficiency Washing Machine Rebate Programs
BMP 07: Public Education Programs
BMP 08: School Education Programs
BMP 09: Conservation Programs for Commercial, Industrial, and Institutional Accounts
BMP 10: Wholesale Agency Assistance Programs
BMP 11: Conservation Pricing
BMP 12: Conservation Coordinator
BMP 13: Water Waste Prohibition
BMP 14: Residential ULFT Replacement Programs

1. The table includes the CUWCC BMPs currently being implemented by the City. The CUWCC BMP 10, Wholesale Agency Assistance Programs, does not apply to the City since the City does not wholesale water to another entity.

Wastewater

All of Petaluma's wastewater is conveyed to the wastewater treatment facility at 950 Hopper Street. Treated wastewater from the wastewater facility is then pumped through a 36-inch force

main from the treatment plant's pond influent pump station to the City's oxidation ponds, located adjacent to Lakeville Highway. From October 20th to May 1st each year, secondary treated wastewater is released into the Petaluma River. However, the City of Petaluma is restricted from releasing any wastewater into the river between May 1st and October 20th by the California Regional Water Quality Control Board, San Francisco Bay Region.

The City operates an extensive water recycling program that recycles all of the wastewater treatment plant's secondary effluent during this period. Secondary recycled water is delivered through eighteen hydrants to ten recycled water customers. During summer months, when discharge to the Petaluma River is not permitted, the facility provides recycled water for approximately 800 acres of agricultural land and a portion of the Adobe Creek Golf Course. In 2004, the City produced approximately 2,400 ac-ft of recycled water, or nearly 40 percent of its annual wastewater effluent.

The City is constructing the Ellis Creek Water Recycling Facility (WRF) east of the Oakmead/Northbay Business Park and adjacent to Lakeville Highway. The new facility will produce tertiary recycled water in accordance with California Department of Health Services (DHS) Title 22 requirements for unrestricted use. Allowable irrigation uses for tertiary recycled water include parks and playgrounds, schoolyards, residential landscaping, unrestricted access golf courses, food crops, and other uses permitted by the DHS through the California Code of Regulation

Energy

Energy resources are used throughout the planning area and the proposed General Plan would alter their consumption within this area.

Energy resources encompass a variety of fuels that provide lighting for homes and offices, keep indoor environments cooled during the summer and heated during the winter, and keep transportation systems operating. The energy shortage that faced the State of California and the rolling blackouts in the summer of 2001 underscore the importance of conserving energy resources. "Energy resource sustainability" is receiving special attention as communities seek ways to meet the energy needs of people today without compromising the energy resource needs of future generations.

Sustainable usage of energy resources can be accomplished through conservation of non-renewable sources and through development of alternative energy sources. Non-renewable energy sources such as electricity, natural gas, and petroleum-based fuels cannot be replenished once they are used. On the other hand, renewable resources such as solar, wind, geothermal, and hydroelectric sources, are readily available and are not vulnerable to the same shortages as non-renewable energy supplies. Petaluma uses electricity, natural gas, and petroleum-based fuels as its primary sources of energy.

Energy Supply and Demand

Almost every community in the State relies on three types of energy. In California, approximately 54 percent of the State's entire energy supply is from petroleum-based fuels. Natural gas makes up 33 percent of the energy supply, and 13 percent comes from electricity (California Energy Commission, 2000). Petroleum-based fuels, or transportation fuels, and natural gas are

considered primary sources because they are readily available. Electrical energy is not a primary source because it requires the consumption of primary energy sources for its generation. These fuel sources have four sectors of demand: transportation; industrial; commercial/office; and residential. The transportation sector in California consumes the plurality of energy supplies at 46 percent of overall energy sources; the industrial sector at 31 percent; residential at 13 percent; and commercial, 10 percent. To serve this demand, petroleum is used to satisfy 54 percent of California's total energy demand. Natural gas supplies 33 percent and electricity contributes 13 percent of total energy use (coal is a relatively unimportant fuel in California accounting for less than 1 percent). In contrast to some other regions of the U.S., relatively little petroleum is used in the residential, commercial, and industrial sectors in California. Thus, electricity and natural gas consumption are nearly synonymous with stationary energy usage, while petroleum consumption is synonymous with transportation energy usage (California Energy Commission, 2000a).

Petroleum Energy

Sources: Petroleum, in the form of gasoline and diesel, are the most common sources of transportation fuels. About half of the oil supply used in California comes from within the State, and the remaining supply comes from Alaska and other countries. Seventy-four percent of California's oil consumption is used for transportation, which is why petroleum is synonymous with transportation. This includes transportation fuels used for cars, trucks, motorcycles, buses, trains, and planes (California Energy Commission website, 2006a). However, petroleum use is far from being considered a sustainable energy resource; as drilling and production of this source approaches "peak" capacity in the coming decade, as many experts believe, or has reached it, as others contend. In either case, it will be difficult for the State to rely nearly exclusively on petroleum-based fuels in the future if it desires a stable transportation fuel market, according to California Energy Commission (CEC) staff (California Energy Commission, 2000b).

Transportation fuels are delivered to Petaluma by trucks from oil refineries to gasoline stations and distributors located throughout the city. Primarily, local service stations provide gasoline and diesel to consumers. Other alternative transportation fuels include methanol, ethanol, compressed natural gas, propane, and electricity.

Usage: Transportation energy, which accounts for about half of all energy use in California, is composed of gasoline and diesel fuels, electricity, and natural gas. The U.S. Department of Energy reports that in the year 2000, approximately 50 percent of California transportation fuel was consumed by industry, 17.4 percent by utilities, and 32.6 percent by non-utilities (2000 and 1999, U.S. Department of Energy, 2000). In the same year, California consumed 1,893,000 barrels of petroleum. Transportation usage includes cars, trucks, motorcycles, buses, trains, and planes. Table 3.5-2 shows the projected transportation fuel demand for California and Table 3.5-3 shows the transportation consumption by the City of Petaluma and the State in 2000.

Table 3.5-2: Transportation Fuel Demand for California

Year	*Gasoline (million gallons)*	*Natural Gas (million therms)*	*Electricity (millions kWh)*	*Diesel (million gallons)*
2000	13.579	19	490	2.648
2005	14.409	38	547	2.914
2010	15.345	38	607	3.151
2015	16.263	38	671	3.348

Note: Estimates based on no significant increase of alternative fuel vehicles and no increase in new light-duty vehicle economy levels beyond 1997 levels.

Source: California Energy Commission Fuels Report, July 1999.

Table 3.5-3: 2000 Transportation Consumption: State and Petaluma

	State Estimated Use for 2000 (million gallons)	*Petaluma Estimated Use for 2000 (million gallons)*
Gasoline Fuel Consumption	13,500[1]	22.42[2]
Diesel Fuel Consumption	2,600[1]	4.31[2]
Total Transportation Fuel Consumption	16,100[1]	26.73[3]

1. Estimates based on 2000 from the California Energy Commission Fuels Report, July 1999.
2. Estimates on total fuel consumption for Petaluma are based upon proportions to gasoline and diesel fuel consumption for California 2000.
3. Passenger transportation assumes an average fleet vehicle efficiency of 18.46 miles per gallon (Caltrans estimate for 2000) and current statewide average of 9,057 vehicle miles per person:

$$\frac{9057 \text{ VMT} \times 54{,}548 \text{ residents}}{18.46 \text{ mg}} = 26.73 \text{ million gallons}$$

Sources: California Energy Commission, U.S. Department of Energy, Caltrans, and EIP Associates

Natural Gas

Sources: California is the second largest consumer of natural gas in the nation. In 1997, the State consumed more than 5.5 billion cubic feet per day. Thirty-six percent of natural gas consumed in California generates electricity. Another 24 percent serves the needs of residential customers. The remaining 40 percent is consumed by the industrial, mining or resource extraction and commercial sectors. The CEC expects that electricity generation needs will lead future growth in California's natural gas demand during the next 20 years (California Energy Commission, Fuels Report, 1999a). Major sources of natural gas include Canada, the southwestern United States, and California. Natural gas is collected from gas wells that tap into underground reservoirs and is then refined for residential and business use. Natural gas is decompressed through regulators and enters the distribution pipeline to local utility providers (Pacific Gas and Electric Company, 2006a).

PG&E provides natural gas to Petaluma through a distribution system made up of an integrated piping network comprised of steel and plastic gas mains ranging in diameter from 1 inch to 12 inches. One transmission line (Transmission Line 21) runs through the City (Jack Rust, pers. comm. 2002a). Petaluma is a participant in the Natural Gas Program, which is a natural gas purchasing pool run by the Association of Bay Area Government's (ABAG) power purchasing program, ABAG Power. ABAG Power consolidates smaller municipal accounts, such as cities and towns, and purchases natural gas in bulk to reduce the rate charged. In 2002, ABAG Power offered its members a savings of approximately six percent over direct service (Jerry Lahr, pers. Comm. 2002a)

Usage: According to the CEC, California used 14,344 million therms of natural gas in 1998.[4] Of the total consumption by the State, PG&E natural gas accounted for 5,365 million therms (California Energy Commission, 2000). In the year 2000, Petaluma consumed approximately 12,373,394 therms of natural gas.

As of 2002, PG&E had adequate capacity to meet the City of Petaluma's peak demand for natural gas (Jack Rust, 2002). The largest user group of natural gas is residential use. Residential use is approximately 9,970,198 therms, or 80 percent of total natural gas use in the city. The number of households is a factor in residential natural gas use (California Energy Commission, 2000). From 1990 to 2000, Petaluma experienced a growth in households of approximately 23 percent. Between 2000 and 2010, the number of households is expected to increase 9 percent; from 2010 to 2020, the number of households is expected to increase by 5 percent (Association of Bay Area Governments, 2001).

Electricity

Sources: In California, electricity is delivered to consumers through transmission grids. The California Independent System Operator (CAISO) regulates 75 percent of California's electricity transmission grids. The grid consists of transmission lines that are ensured equal access by utility companies for distribution (The California ISO website, 2006a). AB 1890, which was enacted by State legislation in 1996, restructured California's electricity market and created a competitive open market. Electricity in California comes from a variety of power producers who generate electricity from fueled plants, hydroelectric powerhouses, and nuclear power. These independent power producers sell power to local utility distributors and transmit electricity to distributors through the power grid. Three 60 kV transmission lines and one 115 kV line make up the transmission grid running through the planning area (Jack Rust, pers. comm. 2002a).

PG&E is the local utility distributor that obtains electricity from the transmission grid and delivers it to the City of Petaluma. The PG&E service area includes approximately 94,000 square miles in Northern and Central California. PG&E's electric distribution system in Petaluma is a 12 kV system that is composed of poles, wires, conduits, substructure, transformers and other equipment.

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1. A therm is a measurement of heat equivalent to 100,000 British thermal units, or Btu (the quantity of heat necessary to raise the temperature of one pound of water one degree Fahrenheit).

Usage: The CEC monitors the State's energy consumption and peak demand. In 1998, the State consumed approximately 244,409 gigawatt hours (GWh), compared to 228,038 GWh in 1990. A gigawatt is equal to one billion watts of energy.[5] The State forecast assumes electric consumption will increase by an average of 2.3 percent annually from 1998, to 279,565 GWh for 2004. Energy that is directly consumed by the City of Petaluma is imported and non-renewable.

Table 3.5-4 shows 2000 electricity consumption and peak demand for California, the PG&E service area, and the City of Petaluma. Peak demand is measured in megawatts, and represents the highest electricity usage in one day within a year. This usually occurs in summer months when air conditioners are used.

Table 3.5-4: 2000 Electricity Consumption and Peak Demand

	State	*PG&E*	*Petaluma*
Annual Electricity Consumption (GWh)	244,409[1]	95,601[1]	484[3]
Peak Demand (MWh)	50,743[2]	19,417[2]	81[4]

1. California Energy Commission 1999 data. PG&E service area in California stretches from Eureka in the north, Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada in the east.
2. California Energy Commission 1998 data, end use peak demand; peak demand is based on highest electricity usage in a year.
3. Estimated annual electricity consumption based on Sonoma County electricity consumption by utility and sector for the year 2000 provided by Andrea Gough, California Energy Commission, February 22, 2002; unpublished commercial model date from California Energy Demand 2000-2010, provided by Glen Sharp, Energy Specialist, California Energy Commission, May 7, 2002; Projections 2002, Association of Bay Area Governments, December 2001; and EIP Associates.
4. PG&E estimate of peak demand based on summer 2001.

Sources: California Energy Commission, PG&E, EIP Associates

2. On average, each home uses about 1,000 watts of energy per year. A GWh thus represents the energy consumed by one million homes in a year.

PG&E electricity supply is sufficient to meet the peak demands of the City of Petaluma for 2002 (Jack Rust, pers. comm. 2002a). For the year 2001, Petaluma consumed approximately 483,884,160 kWh (kilowatt hours) of electricity. A kilowatt is equal to 1,000 watts of power. Commercial users are the largest electricity user group. Commercial development uses approximately 47 percent of the electricity consumed by Petaluma. The commercial sector includes strip commercial, shopping centers, offices, and heavy commercial, which consists of mainly auto-oriented sales and service. Residential development uses approximately 30 percent and industrial uses comprise about 23 percent of the electricity consumed by Petaluma. The top three major industries in Petaluma are agribusiness, tourism, and telecommunications (Petaluma Chamber of Commerce website, 1998). Table 3.5-5 shows electricity usage by land use.

Table 3.5-5: Petaluma Electricity Use by Land Use

Land Use	*Electricity Use (kWh)*	*% of Total Electricity Use*
Residential	144,567,820	30%
Commercial	228,724,140	47%
Industrial	110,595,200	23%
Total Use	**483,884,160**	**100%**

Notes: Estimates based on electricity use for 2000. Estimated annual electricity consumption based on Sonoma County electricity consumption by utility and sector for the year 2000 provided by Andrea Gough, California Energy Commission, February 22, 2002; unpublished commercial model date from California Energy Demand 2000-2010, provided by Glen Sharp, Energy Specialist, California Energy Commission, May 7, 2002; Projections 2002, Association of Bay Area Governments, December 2001; and EIP Associates.

Sources: California Energy Commission and EIP Associates

Total Energy Consumption in Petaluma

It is estimated that for the year 2000, the City of Petaluma used approximately 62.866 therms of energy. Of that total, approximately 54 percent of energy consumption is attributed to transportation, 20 percent to natural gas, and 26 percent to electricity use. Table 3.5-6 shows the estimated energy consumption by Petaluma.

Table 3.5-6: Estimated Total Energy Consumption in Petaluma

Energy Type	*Energy Use (standard measurement)*	*Energy Use (1010 Btu)*
Transportation Fuel	26.73 million gallons	339.85
Natural Gas	12,373,394 therms	123.70
Electricity	483,884 kWh	165.11
Total Use		**628.66**

Notes: Standard units were converted into British thermal units (Btu). A Btu is the quantity of heat required to raise the temperature of one pound of water from 60 degrees Fahrenheit to 61 degrees at a constant pressure of one atmosphere. One kWh is equal to 3,412.14148 Btu, and one therm is equal to 99,976.124488 Btu.

Sources: California Energy Commission and EIP Associates

Solid Waste

Solid waste transfer and disposal facilities are owned and operated by the Sonoma County Department of Transportation and Public Works, which also helps maintain the Countywide Integrated Waste Management Plan (CoIWMP) jointly with the Sonoma County Waste Management Agency (SCWMA).

At this time, the County owns one landfill and owns and contracts the operation of five transfer stations that provide service to its residents. The Central Landfill, located within the Central Disposal Site, is a Class III Landfill with a capacity of 32.65 million cubic yards and was permitted to accept up to 2,500 tons per day of non-hazardous municipal waste. However, the County temporarily stopped accepting waste at the landfill as of September 2005 when contamination was discovered under a portion of the liner at the landfill. The landfill still operates as a transfer station and the County is currently investigating options for long-term waste management in Sonoma County.

Starting in January 2006, Petaluma began contracting with the private hauler Green Waste Recovery for the city's solid waste pickup and disposal. Under various options for waste disposal, Petaluma's waste could go to landfills in Novato, Hollister, Suisun City, or Dixon.

Waste generated in Sonoma County comes from residential, commercial, and mixed residential/commercial sectors. The residential sector accounts for the largest single percentage of waste in the County, 39 percent, followed by commercial at 32 percent. Forty percent of wastes disposed are described as organic, followed by 27 percent paper wastes, other inorganics, plastics, metal, and glass.

Recycling

The Integrated Waste Management Act requires local governments to prepare and implement plans to achieve 50 percent waste reduction by 2000. Sonoma County and individual city recycling and composting programs resulted in a 40 percent diversion rate for the County as a whole in 2000. The 50 percent diversion goal has been extended for the County and a 70 percent goal for 2015 has already been approved by the SCWMA. The County's Source Reduction and Recycling Element (SRRE) documents show how source reduction, recycling, composting, and public education will contribute to the diversion of solid wastes from landfills.

As of 2002, Petaluma had two drop-off/buyback centers, two 20/20 buyback centers, single-family residential curbside recycling, as well as commercial recycling. The curbside recycling program, to be operated under Green Waste, is currently transitioning from the three-bin stacking system to a single-stream bin. In addition, yard waste collection services will be provided on a weekly basis.

Petaluma contributed 8,681 tons of recyclable waste (13 percent of the County's 64,596 tons) and 18,846 tons of composting waste (16 percent of the County's 115,000 tons) in 2000. The City's percentage of participation in County recycling slightly outweighed its proportion of population, at 12 percent of the County's total.

Regulatory Setting

Water and Wastewater

The State Water Resources Control Board (Board) is the agency with authority over water rights in California. California water rights permits often contain terms limiting rates of direct diversion and re-diversion. Direct diversion refers to water diverted directly from streamflows. Re-diversion refers to water that has first been diverted to storage in a reservoir, then released and diverted again (re-diverted) at a point downstream. The Sonoma County Water Agency operates its facilities under four separate Board permits. The combined direct diversion and re-diversion under all four permits is limited to 75,000 acre-feet (24,400 million gallons) per year, with a maximum diversion rate of 180 cubic feet per second.

In the early 1990s, the SCWA began work on a Water Supply and Transmission System Project (WSTSP) to expand its transmission and delivery system capacities by increasing its permitted water rights from the current limit of 75,000 acre-feet per year to 101,000 acre-feet per year, and by increasing the capacity of its transmission system from 92 mgd to 149 mgd. The SCWA identified three key purposes for the WSTSP:

1. Implement water conservation measures that would result in the savings of approximately 6,600 acre-feet (2,150 million gallons) per year.
2. Increase the amount of water diverted from the Russian River by 26,000 acre-feet (8,470 million gallons) per year, thereby increasing the total amount of diversion from 75,000 acre-feet (24,400 million gallons) per year to 101,000 acre-feet (32,900 million gallons) per year.
3. Increase the transmission system capacity by 57 mgd, thereby increasing the total capacity of the transmission system from 92 mgd to 149 mgd.

The facilities contemplated by the WSTSP included Collector No. 6, to be constructed in the Wohler Area, approximately 45 miles of pipelines (including the South Transmission Project, which proposes a new aqueduct parallel to the Petaluma Aqueduct), two booster pump stations, and new water storage tanks to provide an additional 56 million gallons of storage, thus increasing the existing storage from 118.8 million gallons to 174.3 million gallons[6].

On May 19, 1992, the SCWA's Board of Directors adopted Resolution No. 92-0716, which authorized preparation of the Environmental Impact Report for the WSTSP. The Eighth Amended Agreement (1992) authorized the SCWA to prepare technical reports and environmental documentation necessary for expansion of the transmission facilities. The SCWA completed the EIR in October 1998. Shortly thereafter the Friends of the Eel River filed a lawsuit against the Agency. On May 16, 2003, California's First District, Court of Appeals ruled in *Friends*

6. Page 4-22, Russian River Biological Assessment (Entrix, Inc.), September 29, 2004, prepared for SCWA.

of the Eel River v. Sonoma County Water Agency that a portion of the EIR did not comply with the California Environmental Quality Act (Public Resources Code section 20180 *et seq.*)[7].

The vast majority of the EIR survived the lawsuit intact. The SCWA could have prepared an amended EIR to address the issues raised in the lawsuit. Instead the SCWA decided to prepare a completely new EIR and changed the title of the project to the Water Supply, Transmission and Reliability Project ("Water Project"). As reported in the SCWA's Water Supply Workshop Report (November 2004), the objective of the Water Project is to provide a safe, economical, and reliable water supply to meet the defined current and future water supply needs in the Agency's service area. The EIR will be designed to address the deficiencies identified by the Court of Appeal. As of February 2006, the SCWA estimates the EIR will be completed by October 2007. As it is far from certain that the new SCWA EIR will permit the transmission facilities expansion to proceed without further legal challenge, the City assumes that the addition of supply capacity to the City from SCWA, and the timing of any such increase, is also uncertain.

Endangered Species Act

The National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) is the Federal Agency with authority to address Endangered Species Act (ESA) issues. NOAA Fisheries has listed Coho Salmon, Steelhead and Chinook Salmon as "threatened" in the Russian River under the ESA. There are two levels at which species are listed: threatened or endangered. An "endangered" species is one that is in danger of extinction throughout all, or a significant portion of its range. A "threatened" species is one that is likely to become endangered in the foreseeable future.

This action prompted the SCWA, in partnership with the U.S. Army Corps of Engineers (USACE) and the Mendocino County Russian River Flood Control and Water Conservation Improvement District to begin undertaking a Section 7 Consultation under the federal ESA with NOAA Fisheries. The purpose of the Section 7 Consultation is to evaluate the effects of operations and maintenance activities on listed salmonid species and their habitats in the Russian River watershed.

The Section 7 Consultation activities began in 1997. The SCWA reached a milestone in 2004 with completion of *Russian River Biological Assessment (Entrix, Inc.)*. The Biological Assessment (BA) considered potential effects on listed species from proposed new facilities on the Russian River, flood control operations, hydroelectric project operations (Warm Springs Dam), water supply

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7. *Friends of the Eel River v. Sonoma County Water Agency (2003) 108 Cal. App. 4th 859. The court agreed with Friends of the Eel River* that the SCWA's EIR should have, but did not, consider whether proposed curtailments in Eel River diversions would lead to significant cumulative impacts in combination with the proposed project; that the EIR's alternatives analysis was flawed; and that SCWA "must discuss project alternatives that would mitigate any significant cumulative impact of the proposed curtailment of the Eel River diversions and the Agency's Project". After finding that the proposed project neither approved nor made any change to Eel River diversions, and that conditions in the Eel River predated the proposed project, the court nevertheless held that SCWA's EIR must discuss historical harm to salmonid species in the River from past Eel River diversions.

operations (diversion facilities, Lake Sonoma, and Lake Mendocino), water management in Dry Creek and in the East Fork and mainstem Russian River, channel maintenance in the mainstem Russian River and tributaries, and restoration and conservation activities throughout the watershed.

Key findings of the BA related to water supply operations are:

When the Mirabel inflatable dam is raised, water levels below the structure can drop, potentially stranding juvenile fish in the channel downstream of the structure.

Under current water demand levels, water velocities in the Upper and Middle Reaches of the Russian River are higher than optimal for rearing salmonids.

Under current water demands levels, summer flows in Dry Creek can be too high for good rearing habitat. Under buildout water demand levels, flows in Dry Creek would increase above current levels and reach velocities that would make Dry Creek very unsuitable for rearing habitat during most of the summer.

To improve aquatic conditions or reduce the opportunity for injury or harm to listed species, the BA includes proposed changes to project facilities and operations, including:

Make structural and operational changes at the Mirabel and Wohler diversions facilities to reduce effects to young fish.

Focus bank stabilization in the Russian River to specific sites and modify protocols to benefit listed fish species.

Reduce instream flows during the summer in the Russian River and Dry Creek to improve summer habitat for listed species.

Reducing instream flows as described in the last item above would make it more difficult for the SCWA to meet future water supply demands of its customers. Additional water supply measures would be needed for the SCWA to continue to meet all of its customers' demands for water. Some of the measures under consideration include:

Aquifer storage and recovery.

Additional diversion facilities.

A pipeline from Warm Springs Dam and terminating at the mouth of Dry Creek, or at the Mirabel diversion facilities, or at a treatment plant at a site to be determined. Any additional flow releases to meet water supply needs would be conveyed through the pipeline.

A water treatment plant.

The SCWA submitted the BA to NOAA Fisheries in 2004. The next step is for NOAA Fisheries to prepare its Biological Opinion (BO), which is a detailed report of their opinion as to whether or not the actions described in the BA are likely to jeopardize the continued existence of the listed species or result in the destruction or adverse modification of designated critical habitat. As of August 2006, the SCWA anticipates receiving the BO from NOAA Fisheries by the end of 2006.

Temporary Impairment MOU

In December 1999, the SCWA's Board of Directors declared that the reliable summertime water production capacity of the transmission system is temporarily impaired by being limited to an average monthly capacity of 84 mgd. The SCWA further determined that the highest peak demand recorded by the SCWA during the summer months of 1999 was 81 mgd.

To address this impairment, the SCWA, its Water Contractors and the Marin Municipal Water District signed the Memorandum of Understanding Regarding Water Transmission System Capacity Allocation during Temporary Impairment (Impairment MOU) in 2001. The Impairment MOU allocated the SCWA's Transmission System Supply of 84 mgd to its Water Contractors and MMWD through 2002, and increased the allocations in 2003 – 2005 based on a total capacity of 92 mgd, assuming Collector No. 6 would begin operating by Summer 2003. The Impairment MOU expired in September 2005. The signatories to the Impairment MOU are contemplating a new Impairment MOU that would expire in September 2008. Petaluma approved the new Impairment MOU on September 19, 2005. Under the new Impairment MOU, Petaluma's peak flowrate allocation is 17.1 mgd. The 11th Amended Agreement and the new Impairment MOU fix Petaluma's water supply from SCWA for the near future at 13,400 acre-feet (4,366 million gallons) per year and 17.1 mgd.

As noted above, additional supply from SCWA is far from certain, given the potential for further litigation regarding SCWA's Water Project EIR and the outcome of SCWA's federal fisheries consultation. For the purpose of the General Plan 2025 and this Draft EIR, it is assumed that the Impairment MOU will remain in effect during the life of this Plan. It is nevertheless possible that additional supply will be available from SCWA before the end of the planning period.

Energy

Federal Regulations

Duties of the Federal Energy Regulatory Commission include the regulation of the transmission and sale of electricity through interstate commerce, the licensing of hydroelectric projects, and the oversight of related environmental concerns (Federal Regulatory Energy Commission website, 2006).

State Regulations

Energy Efficiency Standards for Residential and Nonresidential Buildings, or Title 24, was established in 1978 by the CEC in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods (California Energy Commission, 1995). The State's Title 24 energy-efficiency standards require the design of new buildings to be energy conserving. The Building Division of Petaluma's Community Development Department reviews the design for compliance with those standards before the City issues a building permit for a project. These standards pertain to permits, certificates, information, and enforcement requirements for designers, installers, builders, manufacturers, and suppliers.

California is using the 2005 Energy Efficiency Building Standards (Title 24), which are more sensitive to the time dependence of energy use, increase the quality of construction and reliability of energy savings, deal with new opportunities including new research and technology in

conjunction with the Energy Commission's Public Interest Energy Research (PIER) Program, and assess economic impacts of the standards as a result of the restructuring of California's electric industry. The 2005 Energy Efficiency Building Standards were adopted on October 1, 2005; all projects that apply for a building permit on or after this date must comply with these standards. In response to rolling black outages from the California Independent System Operators caused a strain on energy demand, the State of California adopted AB 970, the California Energy Security and Reliability Act of 2000. AB 970 was enacted in a focused effort to reduce peak electricity consumption and incorporate energy efficiency measures (California Energy Commission website, 2005).

Solid Waste

State Regulations

The California Integrated Waste Management Board is one of the six agencies under the umbrella of the California Environmental Protection Agency. Its creation, authority, and responsibilities were shaped by two pieces of legislation (AB 939 and SB 1322) signed into law as the Integrated Waste Management Act of 1989. The Act established a new approach to managing California's waste stream, the centerpiece of which mandated goals of 25 percent diversion of each city's and county's waste from disposal by 1995 (accomplished) and 50 percent diversion by 2000 (not accomplished), along with a process to ensure environmentally safe disposal of waste that could not be diverted. The statewide diversion rate started at about ten percent in 1989 and reached 37 percent in 1999 (Sonoma County PRMD, 2006).

The Integrated Waste Management Act, along with Title 14 and Chapter 15 of California's environmental regulations also provided the foundation to put the State on course to comply with federal standards (Subtitle D) for managing solid waste, including the design, construction and operation of landfills. In 1993, California became one of the first states to receive federal approval to assume authority over its solid waste activities, having exceeded the federal standards through the adoption of more stringent State regulations.

County Regulations

The Sonoma County Waste Management Agency, formed in 1992, is the joint powers authority of the nine cities and the County of Sonoma. The specific focus of the Agency's efforts is the implementation of regional waste diversion programs as required by AB 939, including the creation of the Countywide Integrated Waste Management Plan. The Sonoma County 2003 Countywide Integrated Waste Management Plan (CoIWMP) sets forth solid waste planning strategies through the year 2050 and is the regional solid waste planning document for all of the nine Sonoma County cities and the unincorporated county area. The overriding mission of the CoIWMP is to "plan and implement programs to satisfy the county's solid waste management needs for the next 50 years in a manner that is cost-effective and is operated to follow the State of California's solid waste management hierarchy. The hierarchy consists of waste prevention (source reduction), reuse, recycling, composting, and disposal. Additionally, the solid waste management system for the county shall protect public health, safety, and well being; preserve the environment; and provide for the maximum feasible conservation of natural resources and energy" (Sonoma County Waste Management Agency, 2003).

IMPACT ANALYSIS

Significance Criteria

A significant impact would occur with full implementation of the proposed General Plan if the following negative impacts occur to level of service standards for water, wastewater, energy, and solid waste services:

Water demand exceeds available supply or distribution capacity;

New development requires or results in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects;

Wasteful, inefficient, or unnecessary consumption of energy by residential, commercial, industrial, or public uses;

The need for additional energy infrastructure facilities, the construction of which could cause significant environmental effects;

A substantial increase in transportation energy consumption due to the projected increases in trips associated with future population and employment growth.

Solid waste levels exceed available disposal capacity; or

Solid waste levels are in non-compliance with federal, state, or local regulations related to solid waste (e.g., recycling requirements).

Methodology & Assumptions

Methodology and assumptions for the evaluation of projected water, groundwater, conservation and wastewater supply and demand are provided within Appendix C – Water Demand and Supply Analysis Report (June 2006), Appendix D - Water Distribution Master Plan (July 2006) and Appendix F-2 – Groundwater Feasibility Study (February 2004).

The analysis of energy is based on a qualitative assessment of energy demand associated with adoption of the proposed General Plan and information from PG&E regarding provision of energy services to Petaluma. In addition, the proposed General Plan policies are examined to determine what impact, if any, they could have on energy demand.

The analysis of solid waste demand, services, and facilities is based on information provided by the California Integrated Waste Management Board and the projected demand on landfills associated with buildout of the proposed General Plan.

Summary of Impacts

Water Supply

As stated earlier, the projected water supply shortfall is an annual demand of 773 million gallons and an ADMM shortfall of 5 mgd. Expanding the recycled water system as described above offsets annual potable water demands by 464 million gallons and reduces peak day demands by 3.57 mgd, which reduces the annual demand and ADMM shortfalls to 309 million gallons and 1.43 mgd, respectively. The remaining future projected demands can be met through water conservation and groundwater. Impacts, with implementation of proposed policies and program, are not considered to be significant.

Groundwater

A combination of existing wells delivering an average of 0.5 mgd over the course of the four summer months would satisfy the annual supplemental supply condition of 186 acre-feet (60.75 million gallons). These flow rates are significantly below historic groundwater pumping levels (see Groundwater Feasibility Study, Technical Appendix F-2). Through the implementation of the following policies and program the impacts are not considered to be significant.

8-P-19 Ensure adequate water supply during emergency situations by developing potential groundwater resources and aquifer storage capacity, combined with management of surface water, to meet overall emergency water supply objectives. The City's groundwater resources have been historically, and continue to be, preserved to meet emergency needs.

A. The City will develop additional wells to supply the average minimum month water demand for emergency purposes.

B. Work cooperatively with the County of Sonoma to protect and preserve Petaluma groundwater resources, including the preservation and enhancement of significant recharge areas.

C. Evaluate the need and feasibility of developing limited wellhead treatment facilities to insure water quality requirements are met for emergency demand.

8-P-20 Manage groundwater as a valuable and limited shared resource by protecting potential groundwater recharge areas and stream sides from urban encroachment within the Petaluma watershed.

A. The City will use discretionary permits to control construction of impervious surfaces in groundwater recharge areas. Potential recharge area protection measures at sites in groundwater recharge areas include, but are not limited to:

Restrict coverage of impervious materials;

Limit building or parking footprints;

Require construction of percolation ponds on site;

Require surface drainage swales.

B. Urge the County when reviewing development applications, to examine the combined impacts of new septic tanks placed in proximity to wells. The County should examine the cumulative impacts of the allowed development densities in the West Petaluma Specific Plan area and compare the results to established water quality standards. Test wells should be required prior to issuing any building permits.

8-P-21 Protect groundwater quality from surface contamination by requiring 100 foot sanitary seals on all new municipal water supply wells.

Wastewater / Recycled Water

The completion of the Ellis Creek Recycling Facility will serve all wastewater treatment needs of the City of Petaluma to 2025 and beyond. Based on the early planning efforts and additional work (Dodson Engineers, 2005), the recycled water program consists of a least cost combination of tertiary and secondary treatment scenarios that, in combination, distribute all recycled water from the City's Ellis Creek Water Recycling Facility during the period of restricted discharge into the Petaluma River, provide system flexibility, and create sufficient potable use offset. Potable offset is defined as current potable water use that is replaced by tertiary water use.

In preparing the Water Supply and Demand Analysis Report (Volume 2, Appendix C of the Draft General Plan/Draft EIR documents), it became apparent that the amount of potable water demands offset through the use of tertiary recycled water would have to be much higher than the 195 million gallons (600 acre-feet) originally envisioned. A total of 62 potential sites were identified, which could be served with tertiary recycled water. Providing tertiary recycled water to these sites would ultimately provide an average day maximum month potable water offset of approximately 3.57 mgd and an annual potable water demand offset of approximately 464 million gallons (1,423 acre-feet). The Water Demand and Analysis Report calls for a phased approach to further implement the use of recycled water throughout the City of Petaluma. The first customer is the Rooster Run Golf Course, which historically used approximately 138 mg/year of water for irrigation of 126 acres. Since the Rooster Run Golf Course was to be supplied with secondary recycled water by the existing recycled water system, the backbone pipeline was designed and built to be in use by summer 2006. The pipeline will temporarily connect to the existing secondary recycled water system to serve Rooster Run Golf Course until the tertiary system goes online in Year 2009. A summary of the type of customers and potable offset demands are summarized in Table 3.5-7.

Table 3.5-7: Summary Tertiary Recycled Water Customers

Customer Type	*Total ADMM Flowrate (mgd)*	*Number of Customers/Sites*
Golf Course	1.0	2
Open Space	0.2	3
Park	1.3	37
School	1.0	19
Turf	0.1	1
Total	**3.6**	**62**

The tertiary recycled water distribution system will eventually be expanded to serve irrigation needs in all four quadrants of the City. Service to these areas will require significant capital improvements including a new pipeline distribution system, two 1.0 MG reservoirs, pump station and eventually an increase in the tertiary treatment capacity of the Ellis Creek WRF. The system

would be expanded incrementally through 2025. The total cost to expand the recycled water system is estimated at $44.2 million.[8]

Energy and Solid Waste

Population and employment growth envisioned by the proposed General Plan may increase energy demand required by new housing and additional motor vehicles. Compliance with energy-saving building codes and an effective use of alternative modes of transportation, combined with mitigation measures outlined below, would reduce wasteful energy consumption to a less than significant level. Likewise, population and employment growth under the proposed General Plan would increase the generation of solid waste and could increase the demand on landfills. However, continued efforts towards waste diversion through recycling and composting programs, as well as compliance with the policies listed below, will keep impacts from solid waste to less than significant levels.

Impacts and Mitigation Measures

Impact 3.5-1 New development that would result from the proposed General Plan could increase water demand that may exceed available supply. (Less than Significant)

The following proposed policies and programs would reduce the potential for wasteful, inefficient or unnecessary use of potable water supplies:

8-P-1 Optimize the use of imported water from the SCWA to provide adequate water for present and future uses.

A. Prepare, implement, and maintain long-term, comprehensive water supply plans and options in cooperation with the appropriate state and federal agencies, regional authorities, water utilities, and local governments.

B. Support regional efforts towards ensuring that imported water is reliable, cost-effective, and is of high quality.

8-P-2 Work toward development and execution of new water supply agreements with SCWA to ensure adequate potable water.

8-P-3 Work with Sonoma County Water Agency on the South Transmission System Project to develop the parallel aqueduct along the City's preferred eastside alignment in order to improve reliability of water supplies.

8-P-4 The City shall routinely assess its ability to meet demand for potable water.

8. Present worth, 2006 dollars.

A. The City shall continue to monitor the demand for water for projected growth against actual use, and ensure that adequate water supply is in place prior to, or in conjunction with, project entitlements.

B. The City planning staff will discuss water supply with the developer for each new development early in the planning process and inform Water Resources staff of upcoming demands as provided by the applicant.

C. The Community Development Department shall maintain a tiered development record to monitor pending and projected developments to allow a reasonable forecast, by the Water Resources Department, of projected water demand.

D. The City shall upgrade utility billing software as necessary to provide the ability to efficiently track and project water demand trends including, but not limited to, the following parameters:

Land use categories

Customer classifications

8-P-5 Develop alternative sources of water to supplement imported supply.

A. Expand the use of recycled water to offset potable demand.

B. Expand water conservation to further improve the efficient use of potable water.

C. Continue to use groundwater to meet emergency needs.

8-P-6 The City shall utilize the Water Demand and Supply Analysis Report, June 2006 and any amendments thereto, for monitoring, assessing, and improving the City's municipal water supply.

8-P-7 Limit the provision of potable water service to lands within the Urban Growth Boundary with the exception of the provisions outlined in the Urban Growth Boundary measure and incorporated into Chapter 2 Land Use, Growth Management, and the Built Environment.

Water Conservation

The City's continued implementation of the water conservation BMPs listed in Table 3.5-1 will provide water use reductions throughout the planning period. However, to increase water conservation in the future to meet projected water demands, seven additional BMPs will be implemented and are listed in Table 3.5-8. The additional BMP program is scheduled to start in 2008.

Table 3.5-8: Additional City Water Conservation Best Management Practices

Measure	*Description*
Hot Water System for New Developments	Require all new single family and multi family housing units to have a hot water system installed. This includes a recirculation pump and insulated hot water pipes.
High Efficiency Toilet Installation	Provide free contractor installation of high efficiency toilets, either dual flush (6/3 liter) or 4 liters-per-flush toilets.
Rain Sensors	Provide sensors to customers for their automatic irrigation system (controller). Users install sensors themselves.
Landscape Education Training	Combination of three types of training classes: (1) Xeriscape, (2) Homeowner Irrigation, and (3) Promotion of water efficient plants.
ET Controller Rebates	Provide rebates for purchase of weather adjusting (ET) irrigation controllers to customers. Users install controllers themselves.
Landscape Requirements	Establish and enforce new landscape requirements for new non-single family landscaping.
Commercial Urinal Rebates	Selectively provide rebates to businesses to convert to efficient (0.5 gallons/flush) or waterless urinals subject to high use, such as restaurants, theaters, schools, etc.

The new water conservation measures will supplement the City's existing water conservation program, and will be phased in over the years 2008 – 2025. The new measures are projected to boost annual savings by approximately 250 million gallons, and reduce peak day demands by 1.28 mgd. The estimated total cost is $8.3 million.[9] In October 2005, the City began work on a Water Conservation Plan to identify potential water conservation measures and programs that are beyond the scope of the BMPs. This effort will conclude in Fall 2006, and will include a program for additional water conservation savings.

The proposed water conservation program, combined with the proposed recycled water program, will save a total of 714 million gallons of potable water annually, and reduce peak day demands by 4.85 mgd. The remaining potable water shortfall through build-out of the proposed General Plan of 59 million gallons annually and a peak day demand of 0.15 mgd needs to be met through the measured use of groundwater. Implementation of the Conservation Plan and Best Management Practices is not considered a significant impact, through the implementation of the following policies and programs:

8-P-18 Reduce potable water demand through conservation measures.

A. Develop and implement a Water Conservation Plan that incorporates conservation measures beyond the Best Management Practices developed by the California Urban Water Conservation Council.

9. Present worth, 2006 dollars.

B. Continue to expand the application of Water Conservation Best Management Practices.

C. Implement the City's Water Drought Contingency Plan to assist citizens in reducing water use during periods of water shortages and emergencies.

D. Revise the City's Landscape Ordinance to encourage, or as appropriate require, the use of water-efficient landscaping.

E. Regularly update regulations, codes and agreements to implement water conservation and discourage wasteful use of water.

F. Enforce conservation measures that eliminate or penalize wasteful uses of water.

G. Consider adopting a local building code to require the provision/retrofit of low flow water appurtenances in new developments, major remodeling/additions, and/or at time of property transfer or sale.

Water Conservation Program Capital Improvement Projects

The cost of the current and future water conservation program is $9.3 million (Dodson Engineers, 2006). This cost was based on an 80-year present worth cost of the program. This cost includes the continuation of the current BMPs listed in Table 3.5-1 and the future BMPs listed in Table 3.5-8.

Impact 3.5-2 New development may result in the need to expand new wastewater treatment facilities, the construction of which may cause significant environmental effects. (Less than Significant)

The following proposed policies and programs would reduce the potential for significant environmental effects from expansions of existing facilities.

8-P-9 Provide tertiary recycled water for irrigation of parks, playfields, schools, golf courses and other landscape areas to reduce potable water demand.

A. The City will expand the Ellis Creek Water Recycling Facility to provide tertiary and secondary recycled water as outlined in the Recycled Water Master Plan.

B. Operate and maintain the Ellis Creek Water Recycling Facility to produce recycled water to regulatory standards.

8-P-10 The City may require the use of recycled water through the City entitlement process.

A. New development may be required to install a separate recycled water system as deemed necessary and appropriate by the City to offset potable demand.

B. The City will evaluate where the most appropriate potable water offset improvements can be implemented through the City's entitlement process.

C. The City shall determine the appropriate means of potable offset, individual project systems may be required in addition to City-required improvements and/or fees relating to the recycled water offset system.

8-P-11 The City may continue to work with agricultural users to reuse secondary recycled water. In addition, the City may purchase land as a backup reuse site, if deemed necessary and appropriate to meet system needs.

8-P-12 The City will provide water of adequate quality and quantity to meet customer needs. The City, at its sole discretion, will determine whether a given customer's supply will be potable water, tertiary recycled water, secondary recycled water, groundwater, or a combination of these.

8-P-13 The City will work to convert existing potable water customers identified under the City's Recycled Water Master Plan to tertiary recycled water as infrastructure and water supply becomes available.

8-P-14 The water recycling facility shall be operated and maintained in compliance with all State and Federal permit requirements.

8-P-15 Capacity of the water recycling facility shall be maintained, and expanded as necessary, to keep pace with the city's growth.

8-P-16 Comply with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of the City's sanitary sewer collection system.

A. Perform condition assessment of existing facilities.

B. Survey facilities and maintain current system maps.

C. Perform regular cleaning and inspection to help eliminate sanitary sewer overflows.

D. Fund collection system infrastructure replacement on a 100-year life cycle.

E. Regularly update the sanitary sewer flow model and make improvements necessary to support development.

8-P-17 Maintain and expand public access and educational opportunities at the Ellis Creek Water Recycling Facility.

Recycled Water Capital Improvements Program

The capital improvements will include:

Distribution System Piping. A total of 21.7 miles of new recycled water distribution system piping ranging in size from 6-inch to 20-inch diameter will be required at buildout of the tertiary treatment system. The construction is expected to be phased over 20 years depending on development and demands within the City's service area.

Storage Improvements. Two new 1 MG reservoirs will be constructed and located northeast on East Washington beyond Adobe Road. The tanks will be above ground welded steel storage tanks sized for distribution system storage only. No emergency storage will be built.

Pumping Improvements. One additional tertiary-treated recycled water pump will be required at the new WRF.

Treatment Improvements. Additional treatment facilities will be required at the WRF in order to increase capacity from 5.2 mgd to 6.72 mgd to meet future maximum day demands. The treatment improvements are not expected to occur until around 2015.

Impact 3.5-3 The proposed General Plan could result in wasteful, inefficient, or unnecessary consumption of energy by residential, commercial, industrial, or public uses. (Less than Significant)

Implementation of the proposed General Plan would increase residential, commercial, and industrial development within the City. The Proposed Project would result in a buildout population of 72,707, an increase of 156008 residents (above the 2005 population). An additional 6,000 residential units and approximately 6.1 million square feet of non-residential uses could occur under the proposed plan, compared to existing conditions. Subsequently, the increase in residential, commercial, and industrial development associated with the proposed General Plan would increase demand for energy. All development would be required to comply with Title 24, California's energy conservation standards. In addition, the proposed General Plan includes policies to ensure energy use is not wasteful, inefficient, or unnecessary, resulting in a less-than-significant impact.

Proposed General Plan Policies that Reduce the Impact

The following proposed policies would reduce the potential for wasteful, inefficient, or unnecessary consumption of energy. In addition to these policies, the proposed General Plan includes policies supporting alternative transportation to conserve fuel and to reduce residential energy consumption by design and orientation.

4-P-14 Develop and adopt local energy standards that would result in less energy consumption than standards set by the California Energy Commission's (CEC) Title 24.

The State of California addresses energy conservation through Title 24 "Energy Efficiency Standards for Residential and Nonresidential Buildings." Whereas Title 24 applies to new buildings, much of the City west of Highway 101 was developed prior to 1953 and there is a tremendous opportunity to encourage greater energy efficiency in Petaluma's older structures. Energy-efficient air conditioners, high-efficiency lighting, photocell dimming, higher insulation levels, and reflective rooftops are examples of standards that could reduce energy consumption in new and existing buildings.

A. Identify and implement energy conservation measures that are appropriate for public buildings.

B. Identify energy conservation measures appropriate for retrofitting existing structures. Work with local energy utility to encourage incentive programs for retrofitting. Consider the use of alternative transportation fuels among City-owned vehicles and the Petaluma Transit system to reduce dependence on petroleum-based fuels and improve local air quality.

In 2002, the City of Petaluma adopted a Clean City Fleets resolution. The Clean Fleets Program, sponsored by the American Lung Association, directs local government staff to purchase the cleanest vehicle for municipal fleets.

4-P-15 Encourage use and development of renewable or nontraditional sources of energy.

A. Participate in state and local efforts to develop appropriate policies and review procedures for the institution of renewable energy sources such as solar, wind, geothermal, and hydroelectric power.

One such effort began in August 2005, when the City adopted a resolution requiring developers of residential projects of 5 or more units to wire all units for future photo voltaic arrays.

In addition, the State's Emerging Renewables Buydown Program provides rebates to consumers who install qualifying energy systems, such as photo voltaic wind turbines, and fuel cells. As of July 2005, nearly 80 participants from within Petaluma have been involved with the program through the use of solar energy systems.

B. Adopt green building code to allow use of alternative building materials and methods, under a discretionary review process.

C. Work with the Petaluma Area Chamber of Commerce and PG&E in encouraging local businesses to undertake energy audits and implement energy reduction improvements.

D. Consider the feasibility of requiring a percentage of new development to meet 50% of their energy needs from fossil fuel alternatives (e.g., solar panels, etc.).

Impact 3.5-4 The proposed General Plan could require the need for additional energy facilities, the construction of which could have significant environmental impacts. (Less than Significant)

Development under the proposed General Plan would result in 15,600 new residents in the city above the existing (2005) population, as well as increased commercial and industrial uses. This new development would increase demand for natural gas and electricity over existing conditions. However, PG&E is generally considered a "reactive" utility, which will provide natural gas and electricity as customers request their services. In addition, implementation of the proposed General Plan policies would require implementation of conservation methods where feasible to reduce reliance on non-renewable energy sources.

Further, the additional growth and development anticipated under the proposed General Plan could require that natural gas and electricity purveyors expand existing facilities to serve new development within the City. The construction of new natural gas or electrical facilities or expansion of existing facilities may cause environmental effects. Since it is not possible to accurately determine or quantify such environmental effects without site locations and specific project details, construction of future natural gas and electrical infrastructure and expansion of existing infrastructure will be evaluated as each new development is proposed. Through the City's environmental review process, potential environmental impacts associated with future development projects will be evaluated. Since implementation of the proposed General Plan would not substantially increase demand beyond available supply, and environmental effects associated with new or expanded gas and electrical facilities would be analyzed in subsequent environmental reviews, impacts to energy service within the City are considered less than significant.

Impact 3.5-5 The proposed General Plan could cause a substantial increase in transportation energy consumption due to the projected increases in trips associated with future population and employment growth. (Less than Significant)

Transportation-related fuel usage is directly correlated to the number and length of vehicle trips. The number and length of vehicle trips is typically connected to land use and community design. For example, land use plans that encourage outward development at the fringes of the community, or that segregate uses to different regions of the city, require more, longer vehicle trips. Alternately, land use patterns that concentrate a mix of uses around a core area and encourage alternate modes of transportation typically result in fewer, shorter vehicle trips. Locating employment, residential, and commercial/resident-serving uses adjacent to one another make alternate forms of transportation, such as walking or biking, feasible and reduce the length of vehicle trips when they are necessary.

The majority of the new development under the proposed General Plan is concentrated adjacent and to the south of the U.S. 101 corridor, which crosses through the center of Petaluma. A large component of the new uses is mixed-use, interspersed with high-density residential and neighborhood commercial uses. The plan promotes mixed-use development and concentrating urban uses around the existing City core, thus reducing the length and number of vehicle trips.

The proposed General Plan includes the following policies supporting alternative modes of transportation. In addition to these policies, the proposed General Plan includes policies supporting alternative transportation to conserve fuel in the transportation section. Based on the proposed land use plan and policies, the Proposed Project would not result in a substantial increase in transportation fuel consumption, and the impact would be less than significant.

Proposed General Plan Policies that Reduce the Impact

In addition to policies identified under Impact 3.5-1, the following proposed policies and programs would reduce transportation fuel consumption:

5-P-13 Encourage existing major employers to develop and implement Transportation Demand Management programs to reduce peak-period trip generation.

A. Study the feasibility of a citywide TDM program that would be funded by annual fees or assessments on new development.

B. Assign a proportion of TDM fees to Petaluma Transit for expansion of service and future fare reductions or fare elimination.

C. As part of the development code, require TDM measures for all new non-residential development.

D. Assign trip reduction credits and reduced transportation impact fees for demonstrated commitment to TDM strategies.

E. Reduce parking requirements for mixed-use developments and for developments providing shared parking or a TDM program.

F. Establish a TDM program for City of Petaluma employees.

G. Collaborate with Santa Rosa Junior College to minimize the impact of future enrollment growth on local traffic and parking demand, such as through TDM measures, limitations on parking near the College and on-campus parking management.

Impact 3.5-6 New development may result in increased demand for solid waste disposal. (Less than Significant)

Sonoma County and Petaluma are focusing increasingly on waste diversion and recycling through public education and new services and facilities. These factors help accommodate the growing need for solid waste disposal while decreasing per capita solid waste disposal demand. Because Petaluma will likely continue to contract with private waste haulers who transport solid waste to several landfills, solid waste demand will not likely exceed landfill capacity before General Plan buildout in the year 2025. In addition, Petaluma will continue to comply with the Integrated Waste Management Act of a 70 percent diversion rate of solid waste by 2015, the proposed General Plan contains policies to ensure that the solid waste generated by development occurring under the proposed General Plan would reduce the demand for increased landfill capacity.

Proposed General Plan Policies that Reduce the Impact

4-P-16 Continue to work toward reducing solid waste and increasing recycling, in compliance with the Countywide Integrated Waste Management Plan (ColWMP).

4-P-17 Work with Sonoma County to identify environmental and economical means to meet the need for solid waste disposal.

4-P-18 Require new or remodeled multifamily residential and all non-residential development to incorporate attractive and convenient interior and exterior storage areas for recyclables.

4-P-19 Continue to encourage waste reduction and recycling at home and in businesses through public education programs, such as information handouts on recycling, yard waste, wood waste, and hazardous waste.

4-P-20 Consider development of a residential and commercial food waste composting program.

4-P-21 Purchase goods containing recycled materials for City use, to the extent possible.

3.6 HYDROLOGY AND WATER QUALITY

This section addresses potential flooding impacts, effects on surface water drainage patterns, groundwater, and water quality.

ENVIRONMENTAL SETTING

The Petaluma River watershed is located in southern Sonoma and northern Marin Counties. Elevations in the watershed range from sea level at San Pablo Bay to about 3,000 feet mean sea level (MSL) at Sonoma Mountain. Tributaries to the Petaluma River include Petaluma Creek, Willow Brook Creek, Lichau Creek, Liberty Creek, Marin Creek, Wiggins Creek, Wilson Creek, Corona Creek, Capri Creek, Lynch Creek, Washington Creek, East Washington Creek, Thompson Creek, Kelly Creek, and Adobe Creek. The Regional Water Quality Control Board (RWQCB) Basin Plan for the San Pablo Basin classifies the following streams within the City of Petaluma Urban Growth Boundary as major surface waters: Petaluma River, Willow Brook Creek, and Adobe Creek. The lower 12 miles of the Petaluma River flow through the Petaluma Marsh. The river ultimately empties into the northwest portion of San Pablo Bay. Tidal influence extends approximately 14 miles upstream of San Pablo Bay, to near the confluence of Lynch Creek above downtown Petaluma.

Flooding

Substantial flooding has historically occurred in Petaluma when a series of closely-spaced storms move through the watershed, maintaining saturated soils and prolonged high flows in the tributary creeks. Recent large floods have occurred in 1982, 1986, 1995, 1998, and 2005.

There are several areas in the city that historically have experienced significant flooding, such as the Payran Street neighborhood and areas adjacent to the Petaluma River and Willow Brook Creek upstream of Corona Road. In an attempt to eliminate flooding in the Payran Street area, the U.S. Army Corps of Engineers (USACE) constructed the Payran Flood Control Project. The elements of the project included widening of the river channel, removal and replacement of two railroad bridges and two roadway bridges, construction of reinforced sheet pile floodwalls, construction of a channel constriction (weir) at the upstream end of the project, pump stations, and mitigation for environmental impacts.

Another area that has recently flooded is the left overbank of Willow Brook Creek from Ely Road to Old Redwood Highway. In the December 30-31, 2005 flood (known as the New Year's Flood), Willow Brook Creek overflowed its left bank upstream of Old Redwood Highway, with flow escaping to the southeast in various streets and ditches (especially McDowell Boulevard North and the Holm Road ditch) all the way to Corona Road. Figure 3.6-1 shows the approximate limits of flooding that occurred during the New Year's Flood.

The significant flooding that occurred during the New Year's Flood is a useful example to describe the mechanics of flooding in Petaluma. The city had experienced significant rainfall in the days and weeks prior to December 30, 2005. The ground was highly saturated in most areas of the Petaluma watershed when the rain started falling on December 30th. The hydrologic effect of saturated soils with high clay content is similar to that of concrete—rainfall is transformed to runoff with very little infiltration. The upper watershed feeding Petaluma Creek and Willow Brook Creek were especially saturated, and the resulting flooding upstream of Corona Road was substantial.

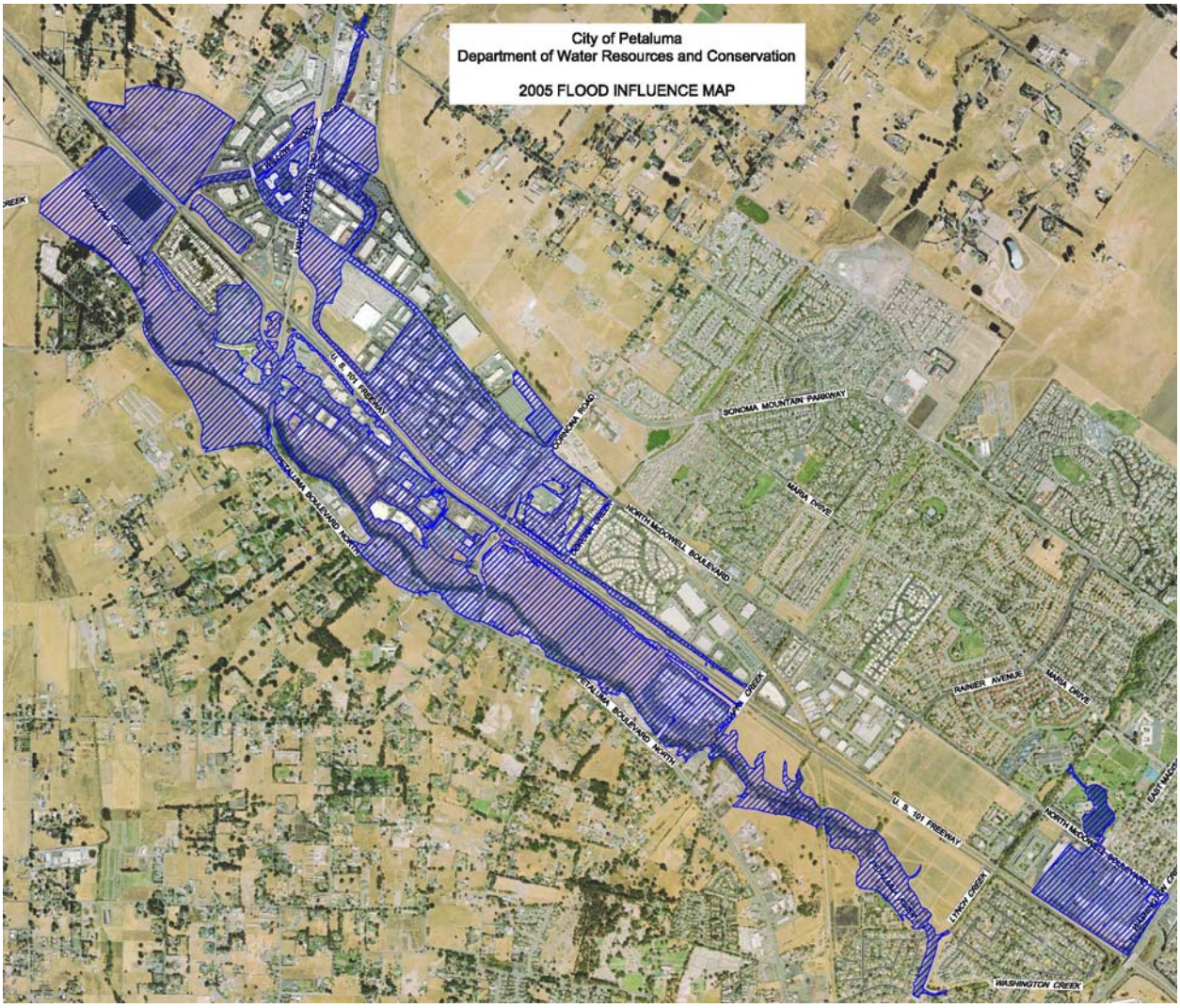

Figure 3.6-1: City of Petaluma Estimate of 2005 New Year's Flood Inundation

The timing of tributary flood peaks to the Petaluma River depends on the size and shape of each contributing watershed as well as the amount of storage provided in the tributary subbasin. Floodplain storage areas are usually flat areas adjacent to the channel where the velocity of the flow is much slower than the flow in the channel. Storage areas will become inundated during the peak flow period with flow receding back to the channel after the peak has passed. Upstream of the confluence of Willow Brook Creek at the headwaters of the Petaluma River there is a natural storage area where Liberty, Marin, and Wiggins Creeks converge. During the New Year's Flood, the storage effect of this area was reflected in gauge data at the Petaluma River confluence with Willow Brook Creek, in which the maximum river level was sustained for three hours and within a foot of the maximum level for nearly 12 hours. Additional storage was provided between Highway 101 and the Petaluma River channel upstream of the Corona/Capri Creek confluence with the Petaluma River. According to XP-SWMM model simulations, which included the effect of upstream storage, the peak flow from Corona/Capri creeks and Lynch Creek arrived a few hours before the Petaluma River peak. Model results such as these can be useful for evaluating floodplain management options. For example, creating detention basins in the Corona, Capri,

and Lynch Creek subbasins may delay the flood peaks from these tributaries so they combine peak-to-peak with the Petaluma River, exacerbating flooding in the river instead of reducing it.

Downstream of the weir (just upstream of Washington Creek), the tide has historically had a significant influence on flood levels. When the Petaluma River flood peak coincides with the high tide, the flood levels are significantly higher. The Payran Flood Control Project was designed to protect this area from flooding for the scenario when the mean highest-high tide is coincident with the 100-year flood peak.

Impacts associated with a 100-year storm event were evaluated against existing conditions and the proposed 2025 General Plan land use plan buildout (see Technical Appendix F-4, City of Petaluma XP-SWMM Surface Water Model Calibration and Analysis Report, August 2006).

Water Quality

The Petaluma River is considered an impaired water body due to sedimentation/siltation and high levels of nutrients and pathogens. The Clean Water Act's Section 303(d) list includes nutrients, pathogens, and sediment as "medium priority" pollutants, while diazinon and nickel are listed as "low priority" pollutants for the Petaluma River. High nutrient levels could be attributed to dairy farms, equine facilities, and livestock producers. Sedimentation problems in tributaries are generally associated with new development and agricultural land use practices. Pathogen problems are generally attributed to agriculture and urban runoff.

The California Environmental Protection Agency and the San Francisco Bay Regional Water Quality Control Board list existing beneficial uses for the Petaluma River, Willow Brook Creek, and Adobe Creek in the Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin. Existing beneficial uses for the Petaluma River include a cold freshwater habitat, marine habitat, fish migration, navigation, preservation of rare and endangered species, water contact recreation, noncontact water recreation, fish spawning, warm freshwater habitat, and wildlife habitat. Although no beneficial uses are listed for Willow Brook Creek and Adobe Creek in the Basin Plan, the City of Petaluma considers Adobe Creek to provide a beneficial use for fresh water fish spawning.

The City has prepared and adopted a Phase II National Pollutant Discharge Elimination System (NPDES) Storm Water Management Plan (adopted November 2003), which is available at Department of Water Resources.

Groundwater[1]

Rivers and stream corridors are important source areas for groundwater recharge, as are some upland areas underlain by permeable formations. When impervious surfaces are placed over groundwater recharge areas, the percolation of surface water into the underlying water table is impaired and the surface water runs off, sometimes resulting in a decrease in groundwater recharge.

The City of Petaluma is located in the Petaluma Valley groundwater basin (number 2.1 in Figure 3.6-2 below). The Petaluma Valley basin is 46,000 acres with total maximum well yields of 100

[1] Section 3.5 also contains a discussion of groundwater.

gallons per minute (gpm). Groundwater budget is defined as numerical accounting of the recharge, discharge and changes in storage of an aquifer, part of an aquifer, or a system of aquifers. According to Bulletin 118, there is not adequate information to evaluate the groundwater budget in the Petaluma Valley groundwater basin.

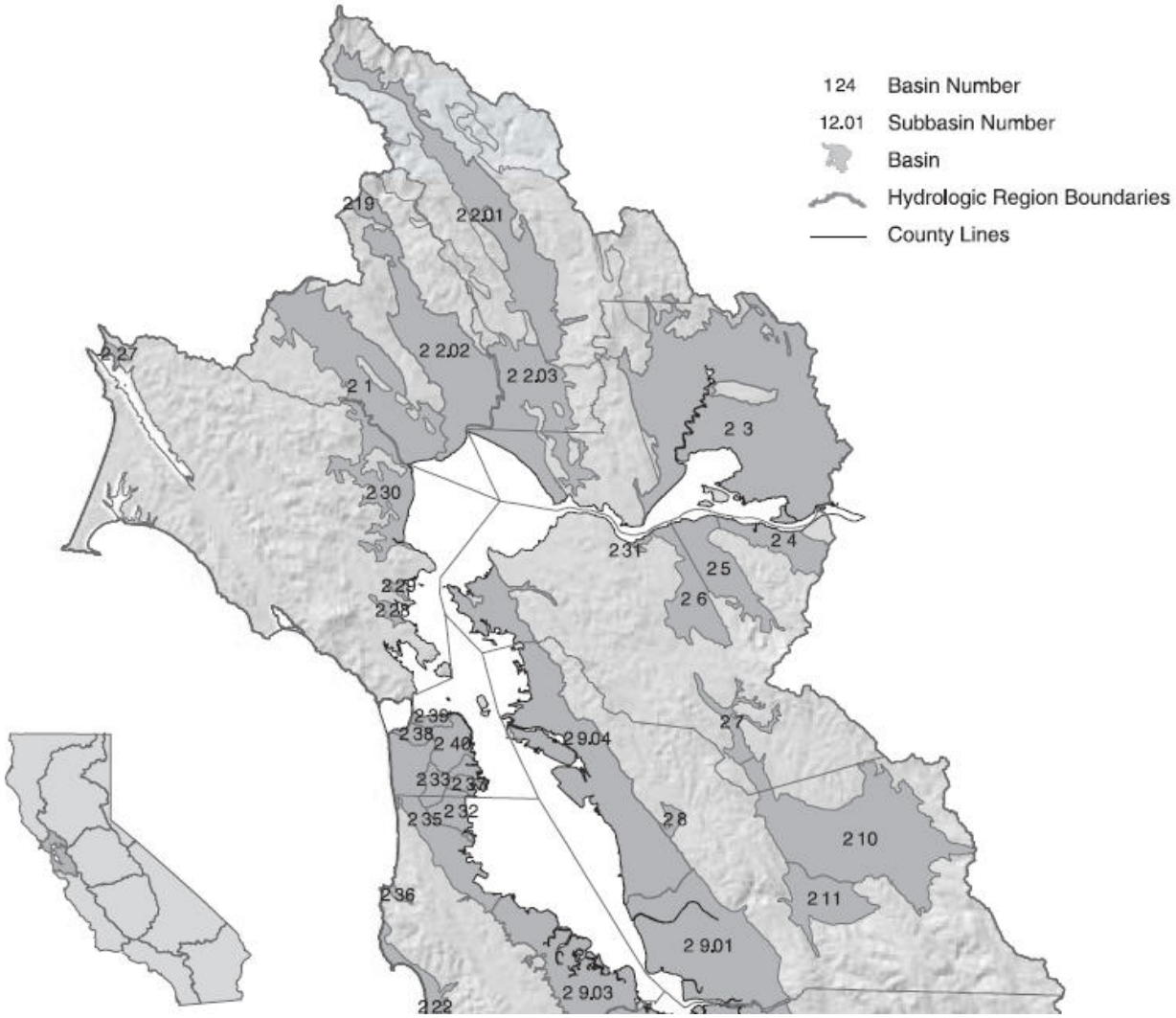

Figure 3.6-2: Bulletin 118 Groundwater Basin Map, San Francisco Bay Hydrologic Region

The City of Petaluma uses groundwater for drinking water supply as an emergency supply and for meeting peak demands, as needed (see Volume 2 of Technical Appendix, Water Supply and Demand Analysis and Water Supply section of this document).

REGULATORY SETTING

Except for water quality issues, most of the regulations affecting water resources (both surface water and groundwater) are contained in the City of Petaluma and/or Sonoma County Code and related ordinances. In addition to City and County ordinances, the City of Petaluma participates in the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA).

The State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) are the principal State agencies with responsibility for the coordination and control of water quality. Per the Water Code, the SWRCB is generally responsible for setting statewide water quality policy and is solely responsible for the allocation or determination of surface water rights. The RWQCBs are responsible for water quality planning and regulatory decisions for their respective regions. The City of Petaluma is located within the San Francisco Bay (Region 2) RWQCB, which includes the Petaluma River. The RWQCBs have the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within their respective jurisdictions. The SWRCB and the nine RWQCBs implement the State and Federal clean water laws, including the NPDES permitting process. As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point source discharges from industrial, municipal, and other facilities if their discharges go directly to surface waters of the United States.

IMPACT ANALYSIS

Significance Criteria

Significant impacts would occur with full implementation of the Petaluma General Plan if results would:

Violate any water quality standards or waste discharge requirements or otherwise degrade water quality;

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, planned uses for which permits have been granted or uses envisioned in the General Plan 2025 buildout);

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, erosion, or siltation on- or off-site;

Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff, or require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

Place housing within a 100-year flood hazard area as mapped on a FEMA Flood Insurance Rate Map (FIRM) or other flood hazard delineation map, or place within a 100-year flood hazard area structures which would impede or redirect flood flows, or 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;

Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Methodology & Assumptions

The analysis considered proposed General Plan goals, policies and programs, hydrologic conditions within the city, the Urban Growth Boundary and its associated Planning Area, and applicable regulations and guidelines. The proposed General Plan would facilitate development

and growth in Petaluma. Consideration is given to creation of new impervious surface area, erosion associated with future development related construction activities, impacts on flooding of the proposed General Plan, and other results of growth, as well as proposed General Plan policies intended to minimize the impacts of growth on water resources.

Summary of Impacts

Proposed General Plan policies and programs would ensure that impacts from increased nonpoint source pollution and increased depletion of groundwater supply or interference with groundwater recharge would remain at less than significant levels. Proposed General Plan policies and program along with additional mitigation measures would reduce significant impacts associated with increased amounts of impervious surfaces, storm drain capacity, and flooding hazards to less than significant levels. In addition, the proposed General Plan contains policies and programs to guide the construction of a new storm water drainage facility and expansion of existing facilities, which are needed under existing conditions, in a manner respectful of natural habitat while allowing the City and County to address surface water flows in southern Sonoma County.

IMPACT ANALYSIS

Impact 3.6-1 Buildout of the General Plan 2025 may degrade water quality. (Less than Significant)

Nonpoint source pollution includes oil and exhaust from cars that settles on City streets and parking lots and is washed into local waterways during storm events. Pollutants also include sedimentation caused by erosion from such activities as ground clearing for construction, chemicals used for lawn and garden maintenance, and litter. New and increased levels of urban land uses can increase the level of nonpoint source pollution that could ultimately wash to area creeks and into the Petaluma River. Increased nonpoint source pollution is considered a potentially significant impact.

Proposed General Plan Policies that Reduce the Impact

8-P-37 Due to potential positive impact to increased water discharge, all development activities shall be constructed and maintained in accordance with Phase 2 National Pollutant Discharge Elimination System (NPDES) permit requirements.

A. The Water Resources and Conservation Department shall review, and have the authority to conditionally approve; all development permits to insure compliance with NPDES Phase 2 requirements (adopted 2003 or thereafter amended).

B. Maintain, update as needed, and implement the City's Storm Water Management Plan to retain a current storm water discharge permit with the California Regional Water Quality Control Board.

Mitigation Measures

No mitigation measures are required.

Impact 3.6-2 Buildout of the General Plan 2025 may increase depletion of groundwater supply or substantially interfere with groundwater recharge. (Less than Significant)

An increase in impervious surfaces may reduce the natural groundwater recharge process. However, most of the areas in Petaluma contain high clay content with poor infiltration and recharge characteristics or are underlain by hard bedrock formations that do not contain sizable groundwater bodies. Major recharge areas are typically located along valley floors and are predominantly urban areas and/or areas where urban and suburban growth would occur, such as the northwest side of Petaluma. High water tables during winter months along the valley floor, in proximity to the River, make recharge utilizing surface water infeasible. Detention of water beyond the rainfall season, for use by adjacent land uses such as farming, could be beneficial to both groundwater recharge and offsetting spring drawdown of wells by intensive farm users (i.e. vineyards, hay crop growing).

A groundwater feasibility study has been completed by the City of Petaluma (see Appendix F-2) to quantify groundwater levels, quality, and recharge characteristics within the City. Based on the results of that study, the City could work with regional agencies such as the Sonoma County Water Agency to identify and prioritize aquifer recharge areas during the site selection process for future regional detention basins, wherever practical.

Proposed General Plan Policies that Reduce the Impact

8-P-20 Manage groundwater as a valuable and limited shared resource by protecting potential groundwater recharge areas and stream sides from urban encroachment within the Petaluma watershed.

A. The City will use discretionary permits to control construction of impervious surfaces in groundwater recharge areas. Potential recharge area protection measures at sites in groundwater recharge areas include, but are not limited to:

Restrict coverage by impervious materials;

Limit building or parking footprints;

Require construction of percolation ponds on site;

Require surface drainage swales.

B. Urge the County when receiving development applications to examine the combined impacts of new septic tanks placed in proximity to wells. The County should examine the cumulative impacts of the allowed development densities in the West Petaluma Specific Plan area and compare the results to established water quality standards. Test wells should be required prior to issuing any building permits.

Mitigation Measures

No mitigation measures are required.

Impact 3.6-3 Buildout of the proposed General Plan may increase drainage flows as a result of impervious surfaces, thereby altering the existing drainage patterns. (Significant)

Development under the General Plan would result in construction of structures on lands that are currently vacant. Streets, parking lots, and rooftops prevent the natural drainage and infiltration of the storm water through the soil. Surface water runoff volumes and rates generated from undeveloped, unpaved areas can increase significantly when that site is paved and the capacity for surface water infiltration is reduced or eliminated.

WEST Consultants, Inc. (WEST) was retained by the City of Petaluma to evaluate the flooding impacts of development under the proposed General Plan 2025 using the City's XP-SWMM computer model (see Technical Appendix F-4). After a thorough review of the City's XP-SWMM model and making necessary changes/revisions, WEST calibrated the model to the New Year's Flood of December 30-31, 2005. Hydrologic and hydraulic model data were calibrated to the City's ALERT stream gage data and to a map prepared by the City of Petaluma that depicts the approximate limits of flooding during the New Year's Flood. After model calibration, WEST evaluated the flooding impacts for the 100-year storm for both the existing condition and the buildout condition under the Draft General Plan 2025. The Mean Highest-High Tide elevation was used as a downstream boundary condition in the model as defined, and required, by the FEMA mapping assumptions and standards. In any 24-hour period two high tides occur. The Mean Higher-High Tide utilizes the higher of the two daily high tides and calculates the mean elevation of the long-term historic data.

The effect of increased impervious surfaces under the General Plan was evaluated in XP-SWMM by revising the impervious percentages of each model subbasin based on proposed changes to affected parcels. The flooding impact of the General Plan buildout scenario was compared to the existing condition by comparing the delineated floodplains of each scenario.

The expected flood boundaries of existing and proposed buildout conditions (see Figure 3.6-3 100-Year Flood Boundary, Existing Conditions and Figure 3.6-4 100-year Flood Boundary, General Plan Buildout Conditions) are virtually identical. This can be attributed to the saturated conditions prior to the New Year's Flood, which was the basis of the model calibration. Increasing the impervious percentage of affected subbasins to reflect the General Plan buildout did not significantly increase the size of the floodplain because the runoff at the peak of the 100-year storm was already characteristic of a highly impervious surface. The history of closely spaced storms in Petaluma supports the model premise that the 100-year storm would likely occur in the same wet antecedent condition as the New Year's Flood of December 2005. This storm analysis presents a worst case scenario. A 100-year storm earlier in the season or with a dryer antecedent condition would result in less flooding. In the study area, historical rainfall data show that the significant rainfall events are more likely to occur in late December, January and February. Early season storms when there might be a difference in runoff impact between new impervious areas under General Plan buildout and unsaturated ground, are very unlikely to be equal in intensity or duration to the 100-year storm.

Proposed General Plan Policies that Reduce the Impact

8-P-28 The area upstream of the Corps weir, and below the confluence to Willowbrook Creek with the Petaluma River, located within the 1989 FEMA floodplain (and any amendments thereto) and adjacent to the Petaluma River, shall include a Petaluma River Corridor (PRC) set aside for the design and construction of a flood terrace system to allow the River to accommodate a 100-year storm event within a modified River channel.

A. The Water Resources and Conservation Department shall work with the Community Development Department, through the project entitlement process, to insure the PRC is implemented at the cost of the development.

B. Maintenance, in perpetuity, of the PRC and applicable flood terrace, storm water flow capacity, environmental habitat and public access improvements shall be maintained, through a funding mechanism approved by the City, as a condition of project entitlement.

8-P-29 Working with SWCA and the Sonoma County Board of Supervisors, the City shall identify the necessary setbacks for the Willowbrook, Marin, and Liberty Creek corridors within the Petaluma Planning Referral Area to include a Creek Corridor set aside for the design and construction of a flood terrace system to allow the Creeks to accommodate a 100 year storm event within a modified creek channel.

A. The City Water Resources and Conservation Department shall work with the SWCA to implement the Petaluma River Watershed Master Drainage Plan (SWCA, June 2003 or future update).

B. The City Water Resources and Conservation Department shall work with the SWCA to study the feasibility, and subsequently implement, a regional serving detention/retention basin system to reduce localized flooding, provide seasonal agricultural water sources, and offer opportunities to enhance recharge of the Petaluma aquifers.

C. The City shall, in accordance with the XP-SWMM analysis of the Petaluma River corridor, work with the regulatory and advisory agencies and property owners along the River to implement the identified physical improvements to accommodate the 100-year storm event within a modified River channel.

D. The City shall, in accordance with the SWCA, undertake a study to assess and define the corridor section widths necessary to quantify the volume and dimension of a creek corridor system necessary to allow the W, M, and L creeks to accommodate the 100-year storm event.

E. Setbacks beyond the creek to allow additional peak flows shall be considered on a reach by reach basis. Alternative land uses for seasonal use may be considered within this additional setback area.

8-P-30 Within a 200' setback from centerline of the River and creeks referenced in Policies 3-P-28 and 2-P-29, stated above [in the General Plan], no development shall be permitted on lands within that 400' wide corridor until such time as the study is concluded and approved by the SWCA and City of Petaluma. Thereafter all lands affected shall set aside the necessary river and/or creek corridor areas and, as development occurs, shall undertake the identified surface water containment enhancement improvements.

A. The watershed model, XP-SWMM or updates thereto, shall be maintained, in cooperation between the City and SCWA, to assist in the evaluation of development proposals and in the design of regional watershed improvements to reduce flood elevations.

B. Proposed development applications may be charged a model update fee to cover costs associated with evaluating a specific proposal for project specific and cumulative impacts to the regional surface water system.

C. On-site and off-site improvements, deemed necessary by the City of Petaluma, to reduce the surface water impacts associated with a specific development proposal shall be designed, constructed, and maintained in perpetuity at the cost of the development associated with said impacts.

8-P-31 In accordance with the studies undertaken for the Corps Flood Protection Project, existing areas subject to periodic surface water inundation and containment, within the Corona and Denman Reaches (Lynch Creek confluence with the Petaluma River upstream to the Old Redwood Highway over-crossing of Willowbrook Creek), shall be preserved and enhanced where feasible to reduce localized flooding.

A. The Department of Water Resources and Conservation shall work with the SWCA and the Community Development Department to insure that reduction of the protection afforded by the Payran Corps Flood Protection Project is not compromised or reduced by proposed development.

8-P-32 Areas within the Petaluma watershed, outside of the City of Petaluma, which are subject to periodic surface water inundation and containment, should not be modified in any manner to reduce the historic storage characteristics and capacity.

A. The City shall work with the County of Sonoma to prohibit placement of fill materials within those areas identified as having historic storage capacity, which have a detrimental impact on downstream flows, including the increase in peak discharge volumes in the downstream areas.

Mitigation Measures

The proposed General Plan policies listed above would not reduce the impact to less than significant levels and the following mitigation measure is required to reduce out of bank flood depths to the extent feasible and environmentally reasonable and beneficial to the riparian corridor.

3.6(a) Use flood terracing in the Corona and Denman Reaches, maintain surface water drainage swales along Highway 101, install flap gates or valves to eliminate the backflow of surface waters from the east side of Highway 101 to the west side, which adversely impact residential areas, and increase berm heights that presently protect residential areas such as Leisure Lake and along Corona Creek between Youngstown and Petaluma Estates Mobilehome Parks. Understanding the out-of-bank impacts associated with the lower intensity storms (10-, 25-, and 50-year return intervals) may allow incremental enhancements of the River corridor to increase capacity without adversely impacting peak flows, while enhancing riparian habitats and providing public access amenities.

Significance After Mitigation

Less than significant.

Impact 3.6-4 New development may overload storm drain system capacity or require expansion of existing or construction of new facilities. (Significant)

The City's surface water management standard includes containing the 10-year storm within a piped or natural creek system, allowing the 25-year storm to utilize the curb to curb capacity of the streets to handle the short-term storm flows. Grading within the flood prone areas, at time of development, may result in the 50-year elevation exceeding the top of the curb but it must be managed within the public right-of-way. Finished floor elevations are required to be placed either one or two-feet above the base flood elevation with an allowance for non-inhabited private property to be inundated by 100-year flood waters. Prior to initiating participation in the FEMA NFIP program the City, and unincorporated areas of the County, allowed development in areas later identified as Floodway. During that same period, structures were built within the regulatory floodplain without the knowledge of a base flood (100-year) elevation, thus flooding of inhabited space has occurred. The intensity of rainfall, the saturation of soils, and the increase in run-off volumes has created flood depths that have resulted in flooding of structures built at the required finished flood elevation above the effective FEMA base flood elevations (revised in 1989). Existing storm drain facilities may have less capacity than necessary to convey increased flows due to upstream development, which could lead to subsequent environmental and fiscal impacts. Existing storm drains that are at or near capacity may need to be replaced.

Proposed General Plan Policies that Reduce the Impact

8-P-33 Work with SWCA to insure maintenance of the engineered channels, natural creeks, and enclosed surface water system.

8-P-34 Work with regulatory and advisory agencies to facilitate preservation and environmental enhancement of the natural corridor for species of importance and native to the area.

8-P-35 Promote public education and stewardship of the riparian corridor.

8-P-36 Work with the U.S. Army Corps of Engineers to dredge the river channel downstream of the constriction weir to maintain the 100-year designed conveyance capacity and navigable channel.

Mitigation Measures

3.6(b) The continuation of zero-net fill and when appropriate, zero-net runoff, within the Development Code will be utilized to assess site-specific impacts and identify mitigations associated with storm drain pipe capacities. In addition, creation of flood terrace improvements shall be used to enhance the riparian corridor for wildlife habitats and improve public access, education and stewardship of the River and creek corridors.

Significance After Mitigation

Less than significant.

Impact 3.6-5 Buildout of the proposed General Plan 2025 may expose people or structures to risk of existing flooding hazards, or may place structures which could impede or redirect flood flows. (Significant)

Even though implementation of the General Plan was shown to not significantly change the 100-year floodplain size when compared to the existing condition, there are significant existing

flooding problems in the City of Petaluma, as evidenced by the damage caused by the New Year's Flood of December 2005. Development and/or redevelopment of parcels that are currently within the 100-year floodplain could expose those structures to repetitive flooding and/or expose people to a significant risk of loss, injury, or death involving flooding.

Proposed General Plan Policies that Reduce the Impact

Implementation of Policies 8-P-28 through 8-P-32 and their associated programs, which are listed under Impact 3.6-3, will help reduce this impact. However, the additional mitigation measure is required to reduce this impact to less than significant levels.

Mitigation Measure

3.6(c) Include the following policy and programs in the proposed General Plan.

Policy 8-P-X. No new inhabited structure or development shall be entitled within the 100-year General Plan buildout flood boundary until such time as data is available to provide a 100-year base flood elevation, utilizing the current hydrologic information from the City's XP-SWMM, for the specific site to determine minimum floor elevations.

A. The City shall create and maintain a 2-D model of the Petaluma River within the City of Petaluma and work with SCWA to achieve a 2-D model for the Petaluma Watershed.

B. Utilizing the 2-D model, the City of Petaluma will work with SCWA to identify, design, fund, and construct regional solutions to minimize the flooding impacts associated with historic and increasing out-of-bank flows which occur from increasing storm flow and velocity from out-of-City areas into the City.

C. Working with Sonoma County, the City will continue to ensure that zero net fill policies are enforced within the unincorporated area for areas encumbered by the regulatory floodplain of the Petaluma River.

D. Utilizing an approved modeling tool, the City shall diligently pursue the remapping of the regulatory Floodway and Floodplain, through the Corps of Engineers, following the completion of the Payran Reach Corps project.

E. Working with Sonoma County, the City shall pursue State and Federal funding opportunities to acquire and demolish housing, which remain located within the regulatory Floodway, once remapping occurs.

Significance After Mitigation

The City's proposed policies and programs will reduce flooding compared to existing conditions to less than significant levels. The magnitude of the reduction will be confirmed using the City's XP-SWMM model data during identification of planned drainage improvements. Using the XP-SWMM model data to evaluate the effectiveness of the Petaluma River Corridor design, regional detention basin(s), and other mitigation measures mentioned above will ensure that peak timing

and storage characteristics of the Petaluma watershed are considered in the design of projects and associated mitigation measures to reduce flood impacts to less than significant levels.

Impact 3.6-6 Buildout of the General Plan 2025 may require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Less than Significant)

As discussed throughout this section, existing conditions call for construction of new storm water drainage facilities and expansion of existing facilities to address both existing and buildout storm waters. Goals, policies and programs throughout this section address both the need for the design and construction of these improvements in a manner respectful of natural habitat and also the need to improve the manner in which the City and the County address surface water flows in southern Sonoma County.

Proposed General Plan Policies that Reduce the Impact

Implementation of Policy 8-P-29 and its associated programs, which are listed under Impact 3.6-3 above, will reduce this impact to less than significant levels.

Mitigation Measures

No mitigation measures are required.

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Figure 3.6-3

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Figure 3.6-4

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3.7 GEOLOGY, SEISMICITY, AND SOILS

This section explains the regional geologic and seismic characteristics influencing the proposed General Plan Planning Area. Local faulting, soils, and the potential effects of seismicity are described. Regulatory and physical settings are described, followed by an analysis of the potential for soil, geologic, and seismic impacts based on specified impact significance criteria. Applicable technical and regulatory framework considerations in assessing and mitigating potential impacts are included in the analysis. Erosion and sedimentation issues are explained briefly in this section of the EIR and are addressed more fully in Section 3.6, Hydrology, Water Quality, and Flooding.

The primary sources of information on which the analysis in this section is based include site observations by EIP Associates; the Petaluma General Plan 2025 Existing Conditions, Opportunities, and Challenges Report; the 1990 River Oaks/Petaluma Outlet Village Master Plan, Draft EIR by Western Ecological Services Company, Inc.; the 1994 Sonoma County Aggregate Resources Management Plan and EIR by EIP Associates and the Sonoma County Planning Commission; regional studies published by federal, State, and local agencies (United States Geological Survey, California Geological Survey (formerly the Division of Mines and Geology), Association of Bay Area Governments, etc.) dealing with geotechnical conditions in the Bay Area; and the Soil Survey of Sonoma County (California Department of Conservation, 1995).

ENVIRONMENTAL SETTING

Physical Setting

The study area for geologic and soil resources is the same as the boundary of the planning area. The study area for issues related to seismicity is regional, taking into consideration seismic activity in the San Andreas Fault System, which is about 44 miles wide in the northern Bay Area (Wallace, 1990).

Regional Characteristics

Soils

The soils of Sonoma County belong to two major groups, which are subdivided into 15 associations. The major soil groups are related to the substrate on which the soils have developed based on a variety of distinguishing characteristics, such as texture, slope, and agricultural capability. Specific soil groups found within the UGB are described below.

Geology

The regional geologic framework of the Bay Area (Figure 3.7-1) and Sonoma County can be understood through the theory of plate tectonics.[1] Earth's mantle is composed of several large plates that move relative to each other. The San Andreas Fault Zone is at the junction of two such plates. The Pacific plate, on the west side of the fault zone, is moving north relative to the North American plate on the east side. All of the geologic formations in Sonoma County are on the

1. The main features of plate tectonics are:

The Earth's surface is covered by a series of crustal plates.

The ocean floors are continually, moving, spreading from the center, sinking at the edges, and being regenerated.

Convection currents beneath the plates move the crustal plates in different directions.

The source of heat driving the convection currents is radioactivity deep in the earth's mantle.

North American plate. The geologic landscape in and around the City of Petaluma was created by the opposing forces of uplift, from pressure caused by the grinding of tectonic plates, and by the continuous erosion of rivers, the actions of landslides, and the activities of humans. One of the results of this plate movement is the regional rock deformation that is expressed in the general northwest trend of valleys and ridges in Sonoma County. This is visible, for example, in the orientation of the Rodgers Creek segment of the Hayward-Rodgers Creek fault system and the Sonoma Mountains northeast of the city. Another result of plate movement is the regional seismicity that Petaluma has in common with the rest of the Bay Area (Oakeshott, 1978).

Seismicity

Petaluma is in the San Andreas Fault System. The principal active faults, on which there is evidence of displacement during Holocene time (the last 11,000 years), include the San Andreas, San Gregorio, Hayward, Rodgers Creek, West Napa, Calaveras, Concord, and Green Valley faults (Bortugno, 1982). Figure 3.7-2 shows the approximate position of the major fault zones, the general distribution of the major groups of rock units, and the location of the project site in relation to these features. Table 3.7-1 contains the estimated maximum parameters for earthquakes on known major faults potentially affecting the Planning Area. Terms that may be unfamiliar to the general public are defined in the glossary at the end of the EIR.

The City of Petaluma, Sonoma County, and the rest of the Bay Area, are in one of the most active seismic regions in the United States. Each year, low and moderate magnitude earthquakes occurring in or near the Bay Area are felt by residents of the City and County. Since the mid-nineteenth century about 150 local earthquakes have been felt in central Sonoma County, including Petaluma. About ten of these earthquakes caused some damage; those of 1906 and 1969 being the most destructive. The April 1906 earthquake on the San Andreas fault, estimated at about Moment Magnitude (MW) 7.9 (M8.3 on the Richter scale), practically destroyed the business district of Santa Rosa (about 17 miles north of Petaluma), causing 61 reported deaths (Huffman and Armstrong, 1980). The October 1969 earthquakes on the Hayward-Rodgers Creek fault registered M5.6 and M5.7. No deaths occurred in the County or cities; however, at least fifteen people were injured and about two million dollars damage was done, including numerous breaks in water system pipes. More recently, the MW 6.9 (M7.1) Loma Prieta earthquake of October 1989 on the San Andreas Fault caused severe damage throughout the Bay Area, but not extensively in Petaluma.

On the basis of research conducted since the 1989 Loma Prieta earthquake, the United States Geological Survey (USGS) and scientists in other agencies conclude that there is about a 62 percent probability of at least one Mw 6.7 or greater earthquake, capable of causing widespread damage, striking the San Francisco Bay region before 2032. The Hayward-Rodgers Creek fault system has the highest probability (27 percent) of generating a Mw 6.7+ earthquake in this timeframe (Working Group on California Earthquake Probabilities, 2003). Earthquakes of this magnitude are sufficient to create ground accelerations in bedrock and, in stiff unconsolidated sediments, severe enough to cause major damage to structures and foundations not designed specifically to resist the lateral forces generated by earthquakes, and to underground utility lines not designed with sufficient flexibility to accommodate expected seismic ground motion (D. Borderdt, 1975).

Figure 3.7-1

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Figure 3.7-2

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Table 3.7-1: Estimated Maximum Parameters for Some Known Active Faults Affecting Petaluma

Fault	*Rodgers Creek*	*Maacama*	*West Napa*	*San Andreas*	*Hayward*
Moment Magnitude[1]	7.1	6.6	6.5	7.9	6.9
Maximum Intensity[2]	X	VII	VII	X	IX
Peak Horizontal Accelerations in Rock and Stiff Soil (Gravity)[3]	>0.6	0.2 – 0.3	0.2 - 0.3	>0.6	>0.5
Approximate Distance and Direction from Site to Fault (Miles)	5 NE	15 N	19 NE	15 SW	20 SE

1. For the purposes of describing the size of the design (or scenario) earthquake of a particular fault segment, moment magnitude (Mw) of the characteristic earthquake for that segment has replaced the concept of a maximum credible earthquake of a particular Richter magnitude. This has become necessary because the Richter Scale "saturates" at the higher magnitudes; that is, the Richter scale has difficulty differentiating the size of earthquakes above magnitude 7.5. The Mw scale is proportional to the area of the fault surface that has slipped, and thus, is directly related to the length of the fault segment. Although the numbers appear lower than the traditional Richter magnitudes, they convey more precise (and more useable) information to geologic and structural engineers.
2. Estimated Modified Mercalli Intensity damage level based on relationships developed by Perkins and Boatwright, 1995, or Richter, 1958 (San Andreas fault only).
3. Estimates based on relationships developed by Seed and Idriss, 1972, Joyner and Boore, 1981, Campbell and Sadigh, 1983.

Source: EIP Associates.

The major fault zones of the San Andreas Fault System were the sources of all these earthquakes, and are expected to be the sources of most future earthquakes in the area (Jennings, 1994). It is necessary to design structures and facilities in Petaluma to withstand the anticipated effects of seismic vibration from distant, as well as nearby, sources (Seismology Committee, Structural Engineers Association of California, 1998). Recognizing this necessity, the City and General Plan Safety Element specifically identifies the Rodgers Creek segment of the Hayward-Rodgers Creek Fault Zone as a potential source of seismic activity that must be taken into consideration during the planning of development in the city.

Regional faults in the vicinity have triggered numerous seismic events in the past 100 years with estimated magnitudes between Mw 6.7 and 8.3. Each of these earthquakes produced moderate and sometimes strong ground shaking (Intensity V to VIII on the Modified Mercalli Scale presented in Table 3.7-2) in the Petaluma Planning Area.

Table 3.7-2: Modified Mercalli Scale of Earthquake Intensities (As Modified by Charles F. Richter in 1956 and rearranged)

Earthquake Intensity	*Effects Observed*
I	Earthquake shaking not felt. But people may observe marginal effects of large distance earthquakes without identifying these effects as earthquake-caused. Among them: trees, structures, liquids, bodies of water sway slowly, or doors swing slowly.
II	Effect on people: Shaking felt by those at rest, especially if they are indoors, and by those on upper floors.
III	Effect on people: Felt by most people indoors. Some people can estimate duration of

Table 3.7-2: Modified Mercalli Scale of Earthquake Intensities (As Modified by Charles F. Richter in 1956 and rearranged)

Earthquake Intensity	*Effects Observed*
	shaking. But many may not recognize shaking of building as caused by an earthquake: the shaking is like that caused by the passing of light trucks.
IV	Other effects: Hanging objectives swing.
	Structural effects: Windows or doors rattle. Wooden walls and frames creak.
V	Effect on people: Felt by everyone indoors. Many estimate duration of shaking. But they still may not recognize it as caused by an earthquake. The shaking is like that caused by the passing of heavy trucks, though sometimes, instead, people may feel the sensation of a jolt, as if a heavy ban had struck the walls.
	Other effects: Hanging objects swing. Standing autos rock. Crockery clashes, dishes rattle or glasses clink.
	Structural effects: Doors close, open, or swing. Windows rattle.
VI	Effect on people: Felt by everyone indoors and by most people outdoors. Many now estimate not only the duration of shaking but also its direction and have no doubt as to its cause. Sleepers wakened.
	Other effects: Hanging objectives swing. Shutters or pictures move. Pendulum clocks stop, start or change rate. Standing autos rock. Crockery clashes, dishes rattle or glasses clink. Liquids disturbed, some spilled. Small unstable objectives displaced or upset.
	Structural effects: Weak plaster and Masonry D* crack. Windows break. Doors close, open, or swing.
VII	Effect on people: Felt by everyone. Many are frightened and run outdoors. People walk unsteadily.
	Other effects: Small church or school bells ring. Pictures thrown off walls, knickknacks and books off shelves. Dishes or glasses broken. Furniture moved or overturned. Trees, bushes shaken visibly, or heard to rustle.
	Structural effects: Masonry D* damaged; some cracks in Masonry C*. Weak chimneys break at roof line. Plaster, loose bricks, stones, tiles, cornices, unbraced pampers and architectural ornaments fall. Concrete irrigation ditches damaged.
VIII	Effect on people: Difficult to stand. Shaking noticed by auto drivers.
	Other effects: Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Furniture broken. Hanging objects quiver.
	Structural effects: Masonry D* heavily damaged; Masonry C* damaged, partially collapses in some cases; some damage to Masonry B*; none to Masonry A*. Stucco and some masonry walls fall. Chimneys, factory stacks, monuments, towers, elevated tanks twist or fall. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off.
IX	Effect on people: General fright. People thrown to ground.
	Other effects: Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes. Steering of autos affected. Branches broken from trees.
	Structural effects: Masonry D* destroyed; Masonry C* heavily damaged, sometimes with complete collapse; Masonry B* is seriously damaged. General damage to foundations. Frame structures, if not bolted, shifted off foundations. Frames racked. Reservoirs seriously damaged. Underground pipes broken.
X	Effect on people: General Panic.

Table 3.7-2: Modified Mercalli Scale of Earthquake Intensities (As Modified by Charles F. Richter in 1956 and rearranged)

Earthquake Intensity	*Effects Observed*
	Other effects: Conspicuous cracks in ground. In areas of soft ground, sand is ejected through holes and piles up into small crates, and, in muddy areas, water fountains are formed.
	Structural effects: Most masonry and frame structures destroyed along with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes and embankments. Railroads bent slightly.
XI	Effect on people: General panic.
	Other effects: Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land.
	Structural effects: General destruction of buildings. Underground pipelines completely out of service. Railroads bent greatly.
XII	Effect on people: General panic.
	Other effects: Same as for Intensity X. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.
	Structural effects: Damage nearly total, the ultimate catastrophe.

*Masonry A: Good workmanship and mortar, reinforced, designed to resist lateral forces; Masonry B: Good workmanship and mortar, reinforced; Masonry C: Good workmanship and mortar, un reinforced; Masonry D: Poor workmanship and mortar, weak materials like adobe.

Source: Richter, C.F., Elementary Seismology, 1958.

Project Vicinity Characteristics

Topography

The geologic landscape in the city was created by the opposing forces of uplift, from pressure caused by the grinding of tectonic plates, and by the continuous erosion of rivers, the actions of landslides, and the activities of humans. The maximum elevation of principle ridges in the Planning Area is approximately 2,295 feet above mean sea level (MSL) in the east (Sonoma Mountain) and approximately 1,200 feet MSL in the southwest. Elevations surrounding the central portion of the Planning Area range from sea level to approximately 200 feet MSL. Groundwater has been reported in the Planning Area at depths ranging from 10 to 15 feet below ground surface. Local groundwater conditions may vary considerably during the periods of drought or intense rainfall.

Soils

Soils in the Planning Area are primarily clayey and sandy loams and loams with high shrink-swell (expansive) potential, and low strength; they are highly compressible and highly corrosive. Two associations are represented inside the Urban Growth Boundary (UGB): basin soils, low terraces, floodplains, and tidal flats in the lowlands; high terrace and foothill soils in the uplands (U.S. Department of Agriculture, 1972). Figure 3.7-3 illustrates the different soil types and farmland in the Petaluma Planning Area.

Western Upland and Central Lowland

The soils in the western upland (high terrace, foothill and mountain areas) belong to the Steinbeck – Los Osos association, which has been characterized by the United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) as moderately well drained and well drained soils consisting of gently sloping to steep loams and clay loams. Minor portions of this area consist of soils belonging to the Pajaro association, which have been classified as poorly drained, nearly level to gently sloping fine sandy loams to clay loams located on low terraces and floodplains.

Eastern Lowland, Terrace, and Upland

The soils in the eastern lowland (basins, floodplains, and alluvial fans) and lower terrace areas belong to the Clear Lake-Reyes and the Haire-Diablo associations, which have been characterized by the USDA-NRCS as poorly drained to moderately drained soils consisting of gently sloping to steep clay and fine sandy to clayey loams. The soils in the eastern upland areas belong to the Goulding-Toomes-Guenoc association, which has been characterized as well-drained soils consisting of gently sloping to very steep clay loams and loams.

Some of the soils and underlying materials in the Planning Area have been rated as having a high potential to corrode uncoated steel and concrete. These include Los Osos, Clear Lake-Reyes, and Haire-Diablo clays found throughout the Planning Area.

Geologic Units

The City is in the northern part of the Coast Ranges Geomorphic Province, which extends from Santa Barbara County to Del Norte County. One of the distinguishing characteristics of the Coast Ranges Province is a strong northwest-southeast trend to the principal mountains and valleys. This is the result of folding and faulting, and is geologically referred to as the "structural grain" of the region. This is seen in the orientation of such features as the Tolay Fault (near the center of the San Andreas Fault System), the Sonoma Mountains and the Sonoma Valley (east-northeast of the Planning Area).

The Planning Area is underlain by sedimentary rocks (estuarine and marine mudstone, sandstone, and conglomerate) of the Merced Formation (western and northwestern portion of the Planning Area; less than 1 million years old) and Petaluma Formation (eastern and northeastern portion of the Planning Area; 10 million years old), with masses of Franciscan

Fig. 3.7-3

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Complex (sandstone, shale, and serpentinite; 140-142 million years old) and minor outcrops of Sonoma Volcanic Group (folded and faulted rocks comprised principally of lava flows and ash beds; 3-8 million years old) commonly exposed along the Tolay Fault and in the southern and southwestern portion of the planning area (Figure 3.7-2). The central portion of the Planning Area is predominantly alluvium (sand, gravel, silt and clay; less than 11,000 years old) interbedded with marine and marsh deposits mostly buried by artificial fill.

Geologic Hazards

The regional seismic context is important because the forces that affect Petaluma are regional in nature: that is, they may be generated outside the Planning Area, or even outside Sonoma County. The effects of these forces must be accommodated in the limits of the Planning Area, in compliance with regulations and guidelines established by the State of California and the City of Petaluma.

Faults

The known active fault traces in and closest to the Planning Area are those of the Rodgers Creek segment of the Hayward-Rodgers Creek Fault Zone as indicated previously (Figure 3.7-1). This is the only fault in the vicinity of Petaluma that is zoned by the State of California under the Alquist-Priolo Earthquake Fault Zoning Act of 1972. No Earthquake Fault Zones or known active faults trace across or trend toward the area inside the UGB. The traces of the Rodgers Creek fault in the Earthquake Fault Zone in and closest to the Planning Area are not historically active (within the last 200 years), but show evidence of activity during the last 11,000 years, a relatively short time in terms of geologic activity.

Previously, the Tolay fault (which appears to parallel U.S. 101 about a mile east of the right-of-way) was identified as an Alquist-Priolo Special Studies Zone (now Earthquake Fault Zone - AP Zone; see explanation below). On the basis of a subsequent fault evaluation report, the California Division of Mines and Geology (now the California Geological Survey – CGS) removed the special studies zone designation and the Petaluma General Plan removed the Hazard Management Zone for the Tolay fault. CGS Studies, in 1982 during the preparation for the AP Zone Map for the Sears Point Quadrangle, and most recently in 1997 during the geotechnical investigations for the Revised Sears Point Raceway Master Plan, the Tolay fault appears to have undergone Holocene displacement (movement within the last 11,000 years). Holocene soils and landslide deposits have been sheared and displaced by traces of this fault, but no fault-related shearing has been observed in the topsoil, which is much younger than 11,000 years. Nevertheless, it is possible that such shearing has been masked by shrinking and swelling of the highly expansive soils. Therefore, it is prudent to assume the fault has some potential for activity, even though it is not zoned as "active" by the State (Bowlby, 1997).

Surface rupture occurs when movement on a fault deep within the earth breaks through to the surface. Not all earthquakes result in surface rupture. The Loma Prieta Earthquake of 1989 caused major damage in the San Francisco Bay Area, but the movement deep in the earth did not break through to the surface in the Bay Area. Fault rupture almost always follows preexisting faults, which are zones of weakness. Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. Sudden displacements are more damaging to structures because they are accompanied by groundshaking. Fault creep is the slow rupture of the earth's crust. Examples of creep are well known along the Hayward fault where it crosses highly developed areas in Contra Costa and Alameda Counties. Although the Hayward fault ruptured suddenly in the 1868

earthquake, it also exhibits slow surface creep that offsets and deforms curbs, streets, buildings, and other structures that lie on top of the fault. There are no known active faults in the city or Planning Area. Consequently, neither surface rupture nor fault creep are considered a hazard in Petaluma.

Groundshaking

ABAG, in cooperation with CGS and USGS, has prepared maps showing expected Modified Mercalli groundshaking intensities in Bay Area cities for specific anticipated earthquakes along known active faults in the region. These maps are based on the magnitude of the characteristic earthquake for the fault, the proximity of the fault to the city, and the attributes of the soils in the city. The groundshaking intensity maps for Petaluma (for various magnitude earthquakes from different active faults in the region) illustrate that groundshaking intensities in different parts of the city can be light, moderate, strong, or very strong. These groundshaking intensities correspond to Intensities V to X on the Modified Mercalli Scale (see Table 3.7-2) (ABAG, 1995).

From a review of regional and local geo-seismic conditions, the Planning Area would probably be subjected to at least one major earthquake during the term of the proposed General Plan. The design earthquake for the Planning Area is estimated by the United States and California Geological Surveys to be a Mw 7.1 earthquake in the Hayward-Rodgers Creek Fault Zone (Figure 3.7-4), creating peak ground accelerations as great as 0.6g and possibly higher. The resulting vibration would cause damage to buildings and infrastructure (primary effects) and could cause ground failures in loose alluvium, landslide deposits, Bay Mud, or poorly compacted fill (secondary effects). To reduce the risks associated with seismically induced groundshaking, the City's Building Code requires that the location and type of subsurface materials be taken into consideration when designing foundations and structures for a particular construction site.

Landslides

In the Petaluma Planning Area, residential development on slopes steeper than 25 percent often is constrained by landslide and slope instability factors, particularly where extensive grading is needed for access roads or home construction purposes. Landslide susceptibility is a function of several factors, including rainfall conditions, rock and soil types, steepness and orientation of slope, bedrock orientation, vegetation, seismic conditions, and human disturbance (i.e., road cuts, grading, construction, removal of vegetation, and changes in drainage). General slope instability determinants can be based on the fact that landslides in the Planning Area have occurred most often on slopes steeper than 15 percent, in areas with a history of landsliding, and in areas underlain by geologic units that have demonstrated stability problems in the past. Existing landslide deposits are shown along the northeast boundary of the Planning Area, as well as near the southeast corner (Figure 3.7-5), but not inside the UGB. Many more ancient and modern slides were mapped by CGS in 1980 in the claystones of the Great Valley Sequence and the Sonoma Volcanics east of U.S. 101, and the sandstones and shales of the Franciscan assemblage and Wilson Grove formation west of U.S. 101 inside the southwest UGB (Huffman, 1980). To reduce the risks associated with landslides, the City's Building Code requires that the stability of subsurface materials be taken into consideration when designing foundations and structures for a particular construction site.

Fig. 3.7-4

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Fig 3.7-5

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Expansive Soils

Expansive soils (clay-rich soils that swell each winter and shrink each summer depending upon the amount of seasonal rainfall) are naturally occurring materials found in low-lying regions and valley flood plains. Expansive soils tend to swell as they absorb water and shrink as water is drawn away. Expansive materials occur in the substrate of the clays and clayey loams in the Planning Area. Buildings, utilities and roads can be damaged by expansive soils and the gradual cracking, settling, and weakening of older buildings in the Planning Area has created significant safety concerns and financial loss. Soils with high clay content occur in many valley areas that are planned for development. To reduce the risks associated with expansive soils, the City's Building Code requires that each construction site suspected of containing expansive soils be investigated and the soils be treated to eliminate the hazard.

Liquefaction

Liquefaction of soils can be caused by strong vibrations due to earthquakes. Loose granular soils and silts that are saturated by a relatively shallow groundwater table are most susceptible to liquefaction. More specifically, the potential for liquefaction is greater when the groundwater is shallow, less than 50 feet below the ground surface. The groundwater table in Petaluma typically is 10 to 20 feet below the ground surface. Other high water tables may exist where perched water accumulates over shallow, impermeable soils. Perched groundwater conditions occur throughout the Planning Area, usually in heavily irrigated areas where water is constantly being filtered into the underlying soil. According to the ABAG Liquefaction Map for Petaluma, a majority of the UGB area is within a Moderate Liquefaction Hazard Level, and the area extending along the Petaluma River is within a High to Very High Liquefaction Hazard Level (see Figure 3.7-5).[2] To reduce the risks associated with liquefaction-prone soils, the City's Building Code requires that each construction site suspected of containing liquefaction-prone soils be investigated and the soils be treated to eliminate the hazard.

Soil Erosion

Soil erosion is a naturally occurring process. The agents of soil erosion are water and wind, each contributing a significant amount of soil loss. The effects of erosion are intensified with an increase in slope (as water moves faster, it gains momentum to carry more debris), the narrowing of runoff channels (which increases the velocity of water), and by the removal of groundcover (which leaves the soil exposed to erosive forces). The potential for soil erosion can be accelerated and increased by cut-and-fill activities, such as may be needed for future development. When completed, surface improvements, such as buildings and paved roads, decrease the potential for erosion onsite, but can increase the rate and volume of runoff, potentially causing off-site erosion. If unmitigated, eroding soil can clog drainages and cause flooding, slope instability, and additional erosion by diverting water flow. To reduce the risks associated with erosion, the City's Building Code requires that the grading of each construction site be planned and implemented to eliminate the hazard. The National Pollution Discharge Elimination System (NPDES) permitting process is instrumental in this effort (see Section 3.6, Hydrology and Water Quality, of this EIR).

2. ABAG website: http://www.abag.ca.gov/cgi-bin/pickmapliq.pl. March 9, 2006. These maps are not intended to be site-specific. Rather, they depict the general risk within neighborhoods and the relative risk from community to community.

Subsidence and Settlement

Subsidence is the sudden (over a period of seconds to days) sinking of an area with little or no horizontal motion. In the Bay Area, it is caused primarily by excessive groundwater or natural gas withdrawal. These activities are not conducted within the UGB and therefore are not of major concern in Petaluma. Nonetheless, groundwater extraction may have begun to create some land subsidence in the far northwestern portion of the Planning Area.

Settlement is the gradual downward movement of an engineered structure (e.g., a building) caused by the compaction of the unconsolidated material below the foundation. Three types of settlement can occur:

Pile settlement caused by building loads;

Consolidation settlement in the layer of young soil of subsurface material; and,

Seismically induced compaction settlement in artificial fill.

Settlement can occur either uniformly or differentially. Uniform settlement in a building can create problems of poor drainage and potential failure of underground utility connections. Differential settlement can cause mechanical problems within a structure, although these can be minimized if the structural engineers are aware of the site conditions. For example, land which is subject to settlement can be surcharged before the building or road construction; that is, a calculated load of temporary dirt fill can be placed on the soil for a predetermined period of time. This has the effect of forcing consolidation of the underlying soils. Based on a review of subsurface conditions in the Planning Area, the possibility of settlement should be investigated during early planning stages prior to any projects construction. Such investigation and treatment is required by the City's Building Code.

REGULATORY SETTING

State

Alquist Priolo Earthquake Fault Zoning Act

The State legislation protecting the population of California from the effects of fault-line ground-surface rupture is the Alquist-Priolo Earthquake Fault Zoning Act. In 1972, California began delineating Earthquake Fault Zones (called Special Studies Zones prior to 1994) around active and potentially active faults to reduce fault rupture risks to structures for human occupancy. This Act has resulted in the preparation of maps delineating Earthquake Fault Zones to include, among others, recently active segments of the San Andreas fault zone. The Act provides for special seismic design considerations if developments are planned in areas adjacent to active or potentially active faults. The northeastern portion of the Planning Area is crossed by the Alquist-Priolo Earthquake Fault Zone delineated along traces of the Rodgers Creek segment of the Hayward-Rodgers creek fault zone. However, no Alquist-Priolo zones are located within the UGB.

California Building Code

The State regulations protecting the public from geo-seismic hazards, other than surface faulting, are contained in California Code of Regulations, Title 24, Part 2 (the California Building Code

[CBC]) and California Public Resources Code, Division 2, Chapter 7.8 (the Seismic Hazards Mapping Act). Both of these regulations apply to public buildings (and a large percentage of private buildings) intended for human occupancy. The CBC is based on the current Uniform Building Code, but contains Additions, Amendments and Repeals that are specific to building conditions and structural requirements in the State of California (International Conference of Building Officials, 1994). City and county codes are permitted to be more stringent than Title 24, but are required to be no less stringent. Chapter 16 of the CBC deals with General Design Requirements, including (but not limited to) regulations governing seismically resistant construction (Chapter 16, Division IV). Chapters 18 and A33 deal with excavations, foundations, retaining walls, and grading, including (but not limited to) requirements for seismically resistant design, foundation investigations, stable cut and fill slopes, and drainage and erosion control.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act became effective in 1991 to identify and map seismic hazard zones for the purpose of assisting cities and counties in preparing the safety elements of their general plans and to encourage land use management policies and regulations that reduce seismic hazards. The recognized hazards include strong groundshaking, liquefaction, landslides, or other ground failure. These effects account for approximately 95 percent of economic losses caused by earthquakes. The Act has resulted in the preparation of maps delineating Liquefaction Zones and Earthquake-Induced Landslide Zones of Required Investigation, but mapping has not yet been extended to the USGS 7.5-minute quadrangles that encompass Petaluma.

Local

City of Petaluma Municipal Code

The Planning Area is in California Building Code Seismic Zone 4, as is about 45 percent of the State, and construction in the Planning Area would be required to meet the most stringent CBC standards. Because no part of the Planning Area is more than 9.3 miles (15 km) from the ground surface projection of known active traces of the Rodgers Creek segment of the Hayward-Rodgers Creek fault zone, CBC Section 1629, Criteria Selection, requires Near-Source Factors for Seismic Source Type A to be applied to the design of proposed structures.[3]

Chapter 18 of the Building Code requires a geotechnical foundation investigation during the project-planning phase for new construction intended for human occupancy. The detailed geotechnical and foundation investigations include site preparation and earthwork, grading, slab-on-grade construction, drainage, pavements, foundation types, retaining walls, seismic design, slope protection, ongoing engineering and foundation investigation, and review during the design, grading, and construction phases of the proposed project. The investigations must be performed by California-licensed geologists and engineers as part of the design phase of each project and the report would be required prior to the time of building permit issuance. At a

3. California Building Code Section 1629.4.2 and Tables 16-S and 16-T define the areas in which Seismic Zone 4 Near-Source Factors apply. The zones extend as far as 15 kilometers (9.3 miles) from the ground surface projection of a known active fault plane. The Near-Source Factors and, therefore, the standards for seismic-resistant design, increase as the distance from a construction site to the fault trace decreases. Seismic Source Type A is described by CBC Table 16-U as "Faults that are capable of producing large magnitude events and that have a high rate of seismic activity," and defined by a maximum moment magnitude of M_w 7.0.

minimum, the investigations must provide information and recommendations for the following items:

Characteristics of the soil materials below the construction site;

Most appropriate type of foundation for the proposed structure;

Static and dynamic design criteria for the recommended foundation type;

Estimated foundation settlement rate;

Necessary subgrade preparation for the foundation;

Lateral pressures for retaining walls;

Design slopes for cut and fill sections; and

Suitability of on-site soils for use as backfill.

The recommendations of the foundation and structural reports prepared for the construction of the project or equivalent measures should normally be incorporated in the final design of each structure. Earthquake-resistant design and materials must meet or exceed the current seismic engineering standards of the CBC Seismic Zone 4 requirements.

IMPACT ANALYSIS

Significance Criteria

Buildout of the proposed General Plan would have a significant adverse soils, geology or seismicity impact if it would:

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 (risk or exposure to fault rupture may result if structures intended for human occupancy are constructed over, or within 50 feet of an active fault trace);
- Strong seismic groundshaking;
- Seismic-related ground failure, including liquefaction; or
- Landslides or mudflows.

Risk from settlement and/or subsidence of the land, lateral spreading, or expansive soils, creating substantial risks to life or property.

Substantial erosion or loss of topsoil from excavation, grading, or fill.

Soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Adverse impacts in any of the above categories would be considered unavoidable significant effects of the project, if they could not be (a) reduced to an acceptable level of risk, (b) eliminated,

or (c) avoided by using existing techniques, generally recognized by geotechnical consultants in the Bay Area to be applicable and feasible.

Methodology & Assumptions

Widely available industry sources were examined to document regional and local geology. Information regarding regional geology and seismically induced hazards was taken from various sources of the CGS and the USGS. Planning Area geologic information, soil characteristics, liquefaction potential, and estimated maximum earthquake magnitudes resulting from potential seismic activity on various active faults in the area were obtained from previous environmental documentation prepared for projects in the general vicinity, as well as from USGS, CGS, and ABAG sources. Where potential geological hazards are identified in the Planning Area, such hazards are expected to affect any potential development. The following analysis considers the potential effects of components of the proposed General Plan described in Chapter 2, Project Description, of this EIR.

Summary of Impacts

The following evaluation illustrates that the design-controllable aspects of building foundation support, protection from seismic ground motion, and slope instability are governed by existing regulations of the State of California and the City of Petaluma. These regulations require that project designs reduce potential adverse soils, geology, and seismicity effects to less-than-significant levels. Compliance with these regulations is required, not optional. Compliance must be demonstrated by the project sponsor to have been incorporated in the project's design before permits for project construction would be issued.

There would be no impacts inside the UGB related to fault rupture or on soils incapable of adequately supporting the use of septic tanks.

There would be no impacts related to seismic groundshaking, seismic-related ground failure, landslides, mudflows, settlement and/or subsidence of the land, lateral spreading, expansive soils, or erosion, because existing State and City regulations require that these hazards be investigated during the project planning process and measures to eliminate them incorporated in the project design prior to completing the project approval process.

Fault-line surface rupture would not be an impact inside the UGB because, while the eastern edge of the planning area is crossed by A-P zoned active traces of the Rodgers Creek segment of the Hayward-Rodgers Creek Fault Zone, this situation does not exist within the UGB. Thus, implementation of the proposed General Plan would have no impact regarding exposing people or structures to rupture of a known earthquake fault.

Landslides would not be a hazard in the part of the city east of U.S. 101 because this area is nearly level and flat. The area west of U.S. 101 inside the UGB contains numerous ancient and modern landslides (some of them associated with mudflows) that would need to be investigated for any construction proposed for human occupancy. Adherence to the foundation support parameters in Chapters 16 and 18 of the Building Code and the grading requirements in Chapters 18 and A33 of the Building Code, as required by City and State law, ensures the maximum practicable protection available from slope failures under static or dynamic conditions for structures and their associated trenches, temporary slopes and foundations. In view of the above,

implementation of the proposed General Plan would have no impact regarding exposing people or structures to landslide hazards.

Buildout of the proposed General Plan would not be located on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. All the soils in the Planning Area are severely limited in their capability to be used as septic tank leach fields. This limitation would not have an adverse effect on the implementation of the proposed General Plan because septic tanks or leach field systems would not be permitted. Wastewater disposal would be through connections to existing sanitary sewer systems. In view of this situation, there would be no impact regarding the use of soils to support septic systems.

Impacts and Mitigation Measures

Impact 3.7-1 Buildout of the proposed General Plan would expose people or structures to strong seismic groundshaking or seismic-related ground failure. (Less than Significant)

From a review of regional and local geo-seismic conditions, it is apparent the City of Petaluma would be subjected to at least one major earthquake during the life of the proposed General Plan (Working Group on California Earthquake Probabilities, 2003). The design earthquake for the Planning Area is estimated by the U.S. and California Geological Surveys to be a Mw 7.1 earthquake on the Rodgers Creek fault, as previously noted. The resulting vibration could cause damage to buildings, roads and infrastructure (primary effects), and could cause ground failures such as liquefaction or settlement in alluvium and poorly compacted fill (secondary effects). Because the Planning Area is crossed by known traces of the Rodgers Creek fault, violent seismically induced groundshaking could occur inside the UGB.

Much of the flatland area inside the UGB is underlain by alluvial materials and Bay Mud that, in their natural state, could respond poorly to loading during seismic ground motion. The older alluvium contains slightly more coarse materials than the younger fluvium, and, therefore, may be slightly less susceptible to failure (including liquefaction) caused by earthquake vibrations. To reduce the primary and secondary risks associated with seismically induced groundshaking, it is necessary to take the location and type of subsurface materials into consideration when designing foundations and structures at the project site. In the City of Petaluma, commercial and institutional buildings and all associated infrastructure are required to reduce the exposure to potentially damaging seismic vibrations through seismic-resistant design, in conformance with Chapter 16, Structural Design Requirements, Division IV, Earthquake Design, of the California Building Code. Because the project site is in the near-source area of the Rodgers Creek fault, Section 1629, Criteria Selection, of the Building Code requires special seismic design factors be applied to the project during site grading and building construction.

Adherence to the Building Code, as required by State and City law, would ensure maximum practicable protection available for users of the building and associated infrastructure. Adherence would include:

> Use of CBC Seismic Zone 4 Standards, including Near-Source Factors, as the minimum seismic-resistant design for all proposed facilities;

Additional seismic-resistant earthwork and construction design criteria, based on the site-specific recommendations of a California Certified Engineering Geologist in cooperation with the project's California-registered geotechnical and structural engineers;

An engineering analysis that demonstrates satisfactory performance of alluvium or fill where either forms part or all of the support, especially where the possible occurrence of liquefiable soils exists; and

An analysis of soil expansion potential and appropriate remediation (compaction, removal/replacement, etc.) prior to using any expansive soils for foundation support.

Based on an existing regulatory framework that addresses earthquake safety issues and adherence to the requirements of the Building Code, seismically induced groundshaking would not be a substantial hazard in the Planning Area. In view of the above, implementation of the proposed General Plan would have a less than significant impact regarding exposing people or structures to seismic groundshaking.

As previously indicated, the Planning Area is identified as a liquefaction hazard zone and potentially unstable soil may exist in the groundwater-saturated alluvial deposits. Potentially unstable soils discovered during excavation are required by provisions of the Building Code to be removed and replaced, or otherwise treated to provide appropriate foundation support and to protect them from failures such as liquefaction. Adherence to the Seismic Zone 4 soil and foundation support parameters in Chapters 16 and 18 of the Building Code and the grading requirements in Chapters 18 and A33 of the Building Code, as required by City and State law, ensures the maximum practicable protection available from ground failure under static or dynamic conditions for structures and their associated trenches, temporary slopes and foundations. Therefore, implementation of the proposed General Plan would have a less than significant impact regarding exposing people or structures to damage resulting from seismically induced ground failure.

Proposed General Plan Policies that Reduce the Impact

10-P-1 Require geotechnical studies prior to development approval in geologic and/or seismic hazard areas. Require or undertake comprehensive geologic and engineering studies for critical structures regardless of location.

Critical structures are those most needed following a disaster or those that would pose hazards of their own if damaged. They include utility centers and substations, water reservoirs, hospitals, fire stations, police and emergency communications facilities, and bridges and overpasses.

10-P-4 Adopt and amend as needed updated versions of the California Building Code (CBC) so that optimal earthquake-protection standards are used in construction and renovation projects.

Earthquake-resistant design and materials must meet or exceed the current seismic engineering standards of the CBC Seismic Zone 4 requirements.

10-P-5 Explore programs that would encourage, assist, or provide incentives to property owners to retrofit their buildings for seismic safety.

Impact 3.7-2 Development under the proposed General Plan would be subject to risk from settlement and/or subsidence of land, lateral spreading, or expansive soils, creating substantial risks to life or property. (Less than significant)

The existence of compressible, corrosive, and expansive soils in the Planning Area makes it necessary to ensure the soils used for foundation support are sound. Using unsuitable soils would have the potential to create future liquefaction, subsidence, or collapse problems leading to building settlement and/or utility line disruption. When weak soils are re-engineered specifically for stability prior to use, these potential effects can be reduced or eliminated. An acceptable degree of soil stability would be achieved for expansive, liquefaction-prone, and compressible soils by the required incorporation of soil treatment programs (replacement, grouting, compaction, drainage control, etc.) in the excavation and construction plans to address site-specific soil conditions. A site-specific evaluation of soil conditions is required by the City's Building Code and must contain recommendations for ground preparation and earthwork specific to the site, that become an integral part the construction design.

The existence of expansive soils inside the UGB raises concerns about foundation stability for dwellings, roads, and utilities. The preceding discussions of soil and seismic issues indicate that the Building Code requires a site-specific foundation investigation and report for each construction site that (a) identifies potentially unsuitable soil conditions and (b) contains appropriate recommendations for foundation type and design criteria that conform to the analysis and implementation criteria described in the City's Building Code, Chapters 16, 18, and A33.

Specific treatments to eliminate the effects of expansion of soils include, but are not limited to, grouting (cementing the soil particles together), recompaction (watering and compressing the soils), and replacement with a non-expansive material (excavation of unsuitable soil followed by filling with suitable material), all of which are commonly used in the city. The City's Building Code requires that each construction location be evaluated to determine the particular treatment, if any, that would be most appropriate. If expansive soils need to be excavated and replaced by non-expansive material hauled from other parts of the Planning Area, or from any location, all haul trucks would need to be covered and project-related mud and dirt carried onto paved streets removed daily to comply with Air Quality Management District requirements to control fugitive dust. Expansive soils are common throughout the city, but contractors and soil testing firms are familiar with the procedures used to identify and eliminate expansive soil conditions at construction sites. In this case, the existence of (1) expansive soils, (2) several well-known and commonly required remedies for such conditions, and (3) local firms' knowledge of the requirements for, and experience in, dealing with these conditions are part of the physical and legal environment in which the proposed General Plan would be implemented.

As part of the construction permitting process, the City requires completed reports of soil conditions at the specific construction sites to identify potentially unsuitable soil conditions including liquefaction, subsidence, and collapse. The evaluations must be conducted by registered soil professionals, and measures to eliminate inappropriate soil conditions must be applied, depending on the soil conditions. The design of foundation support must conform to the analysis and implementation criteria described in the City's Building Code, Chapters 16, 18, and A33. Adherence to the City's codes and General Plan policies would ensure the maximum practicable

protection available for users of buildings and infrastructure and their associated trenches, slopes, and foundations. Thus, implementation of the proposed General Plan would have a less-than-significant impact regarding exposing property or people to the hazards of unstable geologic units or soils.

Impact 3.7-3 Buildout of the proposed General Plan would result in soil erosion. (Less than Significant)

Grading for most structures that would be built under the proposed General Plan is expected to be minimal, consisting of grading for foundations, building pads, access roads, and utility trenches. Excavations for utility trenches and foundations typically involve less than five feet of change in ground surface elevations. Most road and pad grading typically would be less than two feet deep. Nonetheless, deeper excavations could accompany the emplacement of underground facilities in the flatlands or road cuts in the uplands.

Because one of the major effects of loss of topsoil is sedimentation in receiving waters, erosion control standards are set by the Regional Water Quality Control Board (RWQCB) through administration of the NPDES permit process for storm drainage discharge. The NPDES permit requires implementation of nonpoint source control of stormwater runoff through the application of a number of Best Management Practices (BMPs). These BMPs are meant to reduce the amount of constituents, including eroded sediment, that enter streams and other water bodies. A Storm Water Pollution Prevention Plan (SWPPP), as required by the RWQCB, is required to describe the stormwater BMPs (structural and operational measures) that would control the quality (and quantity) of stormwater runoff. Erosion and sedimentation issues are addressed more fully in Section 3.6, Hydrology, Water Quality, and Flooding, of this EIR.

Erosion and sediment transport control also are required by City of Petaluma and Sonoma County general plan policies and regulatory permits (see proposed General Plan policies outlined below). As part of the SWPPP, an Erosion and Sediment Transport Control Plan is required to be prepared for the project prior to the commencement of grading. An erosion control professional, landscape architect, or civil engineer specializing in erosion control must design the Erosion and Sediment Transport Control Plan and be on the project site during the installation of erosion and sediment transport control structures to supervise the implementation of the designs and maintenance of such facilities throughout the site clearing, grading and construction periods. Thus, erosion would not be a substantial hazard under the proposed General Plan at the project site and, implementation of the proposed General Plan would have a less than significant impact regarding soil erosion.

Proposed General Plan Policies that Reduce the Impact

10-P-2 On sites with slopes greater than 30 percent, require all development to be clustered outside of the 30 percent slope areas (and preferably on land less than 15 percent in slope) where possible.

10-P-3 Regulate the grading and development of hillside areas for new urban land uses, by instituting a Hillside Overlay or other similar mechanism in the Development Code. Ensure that new development in hillsides is constructed to reduce erosion and land-slide hazards:

Limit cut slopes to 3:1, except where an engineering geologist can establish that a steeper slope would perform satisfactorily over the long term.

Encourage use of retaining walls or rock-filled crib walls as an alternative to high cut slopes.

Ensure revegetation of cut-and-fill slopes to control erosion. Plant materials for revegetation should not be limited to hydro-seeding and mulching with annual grasses. Trees add structure to the soil and take up moisture while adding color and diversity.

Ensure blending of cut-and-fill slopes within existing contours, and provision of horizontal variation, in order to mitigate the artificial appearance of engineered slopes.

Ensure structural integrity of sites previously filled before approving redevelopment.

See also [General Plan] Chapter 2: Land Use, Growth Management and the Built Environment and [General Plan] Chapter 3: Community Design Character and Sustainable Building for additional hillside policies and programs.

3.8 BIOLOGICAL RESOURCES

This section addresses the potential direct and indirect effects of implementation of the proposed General Plan on biological resources in the planning area. The setting descriptions and impact analyses presented in this section are based on a review of existing documentation and biological databases, and correspondence with resource agencies.

The information serving as the basis for this evaluation included:

CNDDB and USFWS species list databases for the Petaluma, Petaluma River, Cotati, and Glen Ellen 7.5 minute USGS quadrangle maps;

City of Petaluma's Surface Water Analysis – Technical Memorandum 3 – Biological Resources Review, 2003 (Technical Appendices F-3, Volume 4);

Adobe Creek Restoration Plan and Management Program, 1996;

Draft Sonoma County General Plan, 2005;

Draft Santa Rosa Plain Conservation Strategy, 2005;

ENVIRONMENTAL SETTING

Physical Setting

The biological resources planning area includes all lands within Petaluma City's Urban Growth Boundary (UGB). Petaluma River, which runs through the city, drains directly into San Pablo Bay, and waters in the river are thus heavily influenced by tidal forces in its lower reach. Within the UGB, most of the land in the lower reaches is developed and urbanized. Areas along the Petaluma River and its tributaries, however, provide valuable habitat for several special status plant and animal species, as do grassland and oak savannah habitats along the western portion of the UGB.

Habitats

Within the planning area there are eight vegetation types as described in Holland's Preliminary Descriptions of Terrestrial Natural Communities of California (Holland, 1986):

1. *Urban*. Includes ornamental landscaping, non-native grass and weed associations in vacant lots (usually referred to as ruderal vegetation), and scattered agricultural crop and orchard plantings.
2. *Rural/agricultural*. Includes low-density residential/commercial areas, as well as row crops, orchards, and ruderal vegetation. A variety of agricultural products are grown in the planning area, including tomatoes, asparagus, corn, squash, walnuts, apricots, apples, cherries, and grapes.
3. *Grassland/oak savannah.* Non-native grassland vegetation occurs in the western and southern portions of the planning area while oak savannah occurs in the western portions. In many areas, severe levels of grazing have reduced these plant coverings to the extent that bare ground is visible.

4. *Fresh emergent wetlands.* These wetlands are among the most productive wildlife habitats in California. Fresh emergent wetland habitats occur in association with terrestrial habitats or aquatic habitats including Riverine, Lacustrine, and Wet Meadows. These habitat occur in the southern portion of the planning area along the Petaluma River.
5. *Vernal pools/seasonal wetlands*. These temporary ponds create a unique microclimate, which supports an assemblage of plants and wildlife. Vernal pools in the planning area are associated with the grassland and oak savannah communities. The California Department of Fish and Game (CDFG) classifies vernal pools and seasonal wetlands as a sensitive habitat. Vernal pools in the planning area are associated with the grassland and oak savannah communities located outside of the UGB, within the southwestern portion of the Planning Area.
6. *Riparian.* The planning area contains bands of riparian habitat along the Petaluma River and its tributaries.
7. *Northern coastal salt marsh*. These wetlands containing highly productive, herbaceous perennial plants up to 4 feet in height. The salt marsh wetlands located in the lower reaches of the Petaluma River are important habitat for sensitive species such as the salt marsh harvest mouse, California clapper rail, and California black rail.
8. *Brackish water marsh*. Species composition is characterized as being intermediate between salt marsh wetland and freshwater marsh wetland communities, consisting of elements from both communities. The brackish marsh wetlands located in the lower reaches of the Petaluma River are important habitat for sensitive species such as the salt marsh harvest mouse, California clapper rail, and California black rail.

SPECIAL STATUS SPECIES

Special status species are plant and animal species designated by federal or State regulatory agencies as needing protection due to rarity or threats to their existence. Plant and animal species described below include special status species known to occur within the Planning Area. Special status species likely to occur within the planning area are listed in Table 3.8-1 (at the end of this chapter). Figure 3.8-1 shows CNDDB occurrences of special status species in the Planning Area and urban growth boundary (UGB). These species are discussed below, differentiating between those potentially occurring within the UGB – the area targeted for buildout of the General Plan, and those found only in a portion of the Planning Area outside of the UGB.

Figure 3.8-1

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Table 3.8-1: Special Status Species Known to Occur or Potentially Occurring within the Petaluma Planning Area

	Status			
Common Name (Scientific Name)	*Federal*	*State*	*CNPS*	*Habitat or potential habitat*
Invertebrates				
Ricksecker's water scavenger beetle *(Hydrochara rickseckeri)*	FSC	-		Found in freshwater streams and lakes. The river environs contain suitable habitat for the species.
Vernal Pool Tadpole Shrimp *(Lepidurus packardi)*	FE	-		Seasonal wetlands and vernal pools.
Longhorn Fairy Shrimp *(Brachinectra longiantenna)*	FE	-		Seasonal wetlands and vernal pools.
Conservancy Fairy Shrimp *(B. conservatio)*	FE	-		Seasonal wetlands and vernal pools.
Vernal Pool Fairy Shrimp *(B. lynchi)*	FT	-		Seasonal wetlands and vernal pools.
Fish				
Pacific Lamprey *(Lampetra tridentate)*	FSC	-		Found in fresh tributaries of the San Francisco Bay.
Chinook salmon *(Oncorhynchus tshawytscha)*	FE	SE		River environs
Sacramento Splittail *(Pogonichthys macrolepidotus)*	FSC	CSC		River environs.
Central Coast Steelhead ESU *(Onchorhynchus mykiss)*	FT	CSC		Found in freshwater streams to spawn. Have been verified in the Petaluma River, Adobe and Willow Brook creeks.
Amphibians				
California Red-legged Frog *(Rana aurora draytonii)*	FT	CSC		Lowlands, foothills, woodlands, and grasslands; usually near marshes, pools, or perennial creeks
Foothill Yellow-legged Frog *(Rana boylii)*	FSC	CSC		Ephemeral creeks with a well developed riparian canopy. Occurrences have been reported in Adobe Creek, near the eastern limits of the Planning Area.
California Tiger Salamander *(Ambystoma californiense)*	FE	CSC		While these salamanders have not been reported within the Planning Area, occurrences have been reported immediately to the north in Cotati. It is likely that this species may occur within the seasonal wetlands and vernal pools of the Planning Area.
Western spadefoot toad *(Spea hammondii)*	FSC	CSC		Ephemeral wetlands and vernal pools for breeding.
Reptiles				
Western Pond Turtle *(Clemmys marmorta)*	FSC	CSC		An aquatic turtle of streams, ponds and marshes; requires basking sites. Found along the Petaluma River riparian corridor and in the far upper reaches of some creeks.

Table 3.8-1: Special Status Species Known to Occur or Potentially Occurring within the Petaluma Planning Area

Common Name (Scientific Name)	*Status*			*Habitat or potential habitat*
	Federal	*State*	*CNPS*	
Birds				
Merlin *(Falco columbarius)*	-	CSC		Throughout the Planning Area
Golden Eagle *(Aquila chrysaetos)*	-	CSC/FP		Throughout the Planning Area
White Tailed Kite *(Elanus leucurus)*	FSC	FP		Grassland foothills with scattered oaks for nesting and perching; open grasslands or marshlands for foraging. Found throughout the Planning Area
Cooper's Hawk *(Accipiter cooperi)*	-	CSC		Throughout the Planning Area
Ferruginous Hawk *(Buteo regalis)*	FSC	CSC		Throughout the Planning Area
California Black Rail *(Laterallus jamaicensis coturniculus)*	FSC	ST/FP		Lower reaches of the river environs contains brackish and salt marsh wetlands; provides habitat for rails.
California Clapper Rail *(Rallus longirostris obsoletus)*	FE	SE/FP		Lower reaches of the river environs contains brackish and salt marsh wetlands; provides habitat for rails.
Salt Marsh Common Yellowthroat *(Geothlypsis trichus sinuosa)*	FSC	CSC		Found in the brackish and salt marshes of the Petaluma River.
Mammals				
Salt-marsh Harvest Mouse *(Reithrodontomys raviventris)*	FE	SE/FP		The lower sections of the river, characterized by areas of Northern coastal salt marsh and containing pickleweed, provide habitat for this mouse.
Pallid bat *(Antrozous pallidus)*	-	CSC		Throughout the Planning Area.
Townsend's western big-eared bat *(Corynorhinus townsendii)*	FSC	CSC		Throughout the Planning Area.
Western mastiff bat *(Eumops perotis californicus)*	FSC	CSC		Throughout the Planning Area.
Long-eared myotis bat *(Myotis evotis)*	FSC	-		Throughout the Planning Area.
Fringed myotis bat *(Myotis thysandodes)*	FSC	-		Throughout the Planning Area.
Plants				
Point Reyes Checkerbloom *(Sidalcea calycosa ssp rhizomata)*	-	-	1B	Found in freshwater marshes.
Alkali Milk Vetch *(Astragalus tener var tener)*	-	-	1B	Alkali playas, valley and foothill grasslands with heavy clay soils, and vernal pools.
Franciscan Onion *(Allium peninsulare var franciscanum)*	-	-	1B	Cismontane woodland and valley, and foothill grassland.
Petaluma Popcorn Flower *(Plagiobothrys mollis var vestitus)*	-	-	1A	Marshes, valley and foothill grassland.
Round-leaved Filaree *(Erodium macrophyllum)*	-	-	2	Cismontane woodland and valley, and foothill grassland.

Table 3.8-1: Special Status Species Known to Occur or Potentially Occurring within the Petaluma Planning Area

	Status			
Common Name (Scientific Name)	*Federal*	*State*	*CNPS*	*Habitat or potential habitat*
Sonoma Spineflower *(Chorizanthe valida)*	FE	SE	1B	Sandy coastal prairie areas.
Yellow Larkspur *(Delphinium luteum)*	FE	SR	1B	Chaparral, coastal prairie, and coastal scrub.

Source: CA Dept. of Fish & Game, U.S. Fish and Wildlife Service, California Native Plant Society (CNPS), California Natural Diversity Database (CNDDB)

Federal (U.S. Fish and Wildlife Service):
FE = Federally listed as Endangered
FT = Federally listed as Threatened
FSC = Federal Species of Concern

State (California Department of Fish and Game):
SE = State listed as Endangered
ST = State listed as Threatened
CSC = California Species of Special Concern
ST = State listed as Rare
FP = Fully Protected

California Native Plant Society (CNPS):
List 1A = Plants presumed extinct in California.
List 1B = Plants rare, threatened, or endangered in California and elsewhere.
List 2 = Plants rare, threatened, or endangered in California but more common elsewhere.
List 3 = Plants about which more information is needed.

Special Status Species found within the UGB

The following special status species have recorded CNDDB occurrences in the UGB: Coastal Brackishwater snail, Central Coast Steelhead, Sacramento Splittail, Western Pond Turtle, California red-legged frog, foothill-yellow legged frog, Saltmarsh Common yellowthroat, San Pablo Song Sparrow, California Black Rail, American badger, pallid bat, Salt-marsh harvest mouse, Franciscan onion, Alkali milk vetch, Point Reyes checkerbloom, Petaluma popcorn-flower, Sonoma spineflower, Round-leaved filaree, Showy Indian clover, Marsh microseris, Yellow larkspur.

Invertebrates

California brackishwater snail (*Mimic tryonia*) – the California brackishwater snail is federal Species of Concern and a state –listed Special Animal. The snail is found in Coastal lagoons and salt marshes from Sonoma County to Ensenada, Mexico and they inhabit variety of subtidal sediment types and are capable of withstanding wide range of salinities. The CNDDB has recorded occurrences of the snail within the UGB, in the coastal brackish marsh adjacent to the wastewater treatment plant.

Fish

Central Coast Steelhead ESU *(Onchorhynchus mykiss)* – This evolutionarily significant unit (ESU) is a federally-listed Threatened species, and a CDFG Species of Special Concern. Steelhead is an anadramous form of rainbow trout, which return to freshwater streams to spawn. In February 1994, the National Marine Fisheries Service (NMFS) identified and established 15 ESU's of west coast steelhead populations. The central California coastal steelhead ESU was listed as threatened under the FESA of 1973 on October 17, 1997, and consists of steelhead populations from the Russian River south to and including Soquel Creek in Santa Cruz County. This ESU also includes San Francisco Bay and its tributaries, excluding the Sacramento/San Joaquin River system east of Vallejo, California. Steelhead trout located in the Petaluma River and its tributaries

belong to the central California coastal steelhead ESU. The CNDDB has recorded occurrences of the fish in Adobe Creek in the UGB and Planning Area. Suitable habitat also exists in Willow Brook.

Sacramento Splittail *(Pogonichthys macrolepidotus*) – Sacramento splittail is a federal Species of Concern, and California Species of Special Concern. The Sacramento splittail is a large minnow that can grow to lengths in excess of 30 centimeters (cm) and prefers the slow moving lower reaches of rivers. The splittail has been observed to tolerate salinities of up to 18 parts per thousand (Moyle, 1995). Sacramento splittail have historically occurred throughout San Francisco Bay and its tributaries, but present day investigations have shown the species to be in rapid decline. Within the UGB area, CNDDB reports the occurrence of Sacramento splittail in the Petaluma River near the Lynch Creek confluence.

Reptiles

Western Pond Turtle (*Actinemys marmorata*) – This turtle is a CDFG Species of Special Concern. Historically, the western pond turtle had a relatively continuous distribution in most Pacific slope drainages from Klickitat County, Washington along the Columbia River to Arroyo Santo Domingo, northern Baja California, Mexico. They can be found in ponds, lakes and slow moving streams. While usually found near water, western pond turtles require adjacent grasslands on south-facing hills for nesting sites. The CNDDB contains several occurrences of western pond turtles in the UGB and Planning Area near the Petaluma River and its tributaries.

Amphibians

California red-legged Frog (*Rana aurora draytonii*) - This frog is federally Threatened, and a California Species of Special Concern. The aquatic and riparian habitats found within Petaluma provide known habitat for the California red-legged frog. The California red-legged frog occurs in lowlands, foothills, woodlands, and grasslands- usually near marshes, pools, perennial creeks or other permanent water sources, generally with emergent and sub-emergent vegetation. Red-legged frogs disperse widely following the onset of the rainy season and are known to travel up to 1.5 miles in search of breeding habitat. They lay their eggs in loose, oval-shaped, floating clusters of two to five thousand eggs in floating vegetation. The CNDDB contains several records of California red-legged frog occurrences within the UGB and Planning Area.

Revised critical habitat for the California red-legged frog was proposed in 2005 (Federal Register 70:66905), and was final April 2006. Previously, proposed critical habitat included areas just downstream of Petaluma along the Petaluma River. The re-proposed 2006 critical habitat does not include any critical habitat in Sonoma County.

Foothill yellow-legged frog (*Rana boylii*) – This amphibian is a California Species of Concern. The foothill yellow-legged frog historically occurred in the Coast Ranges from the Oregon border south to the Transverse Mountains in Los Angeles County, in most of northern California west of the Cascade crest, and along the western flank of the Sierra south to Kern County. Adults often bask on exposed rock surfaces near streams. When disturbed, they dive into the water and take refuge under submerged rocks or sediments. During periods of inactivity, especially during cold weather, individuals seek cover under rocks in the streams or on shore within a few meters of water. In California, breeding and egg laying usually await the end of spring flooding and may commence any time from mid-March to May, depending on local water conditions. The breeding season at any locality is usually about two weeks for most populations. The CNDDB contains

records of the foothill yellow-legged frog in Adobe Creek, within the easternmost portion of UGB area.

Birds

California black rail (*Laterallus jamaicensis coturniculus*) – California black rail is a federal Species of Special Concern and California Threatened Species. Historically, California black rail was known from the San Francisco Bay area and the delta of the Sacramento and San Joaquin rivers south along the coast to northern Baja California, and in the San Bernardino-Riverside area, at the Salton Sea, and also along the lower Colorado River north of Yuma in California and Arizona. Most recorded occurrences are in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrushes in association with pickleweed. In freshwater, they are usually found in bulrushes, cattails, and saltgrass. CNDDB records of black rail occur within the coastal brackish marsh located on the Petaluma River, adjacent to the wastewater treatment plant, within the UGB area.

Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*) – The Saltmarsh common yellowthroat is a federal and State Species of Concern. In California, yellowthroats are found in freshwater marshes, coastal swales, swampy riparian thickets, brackish marshes, salt marshes, and the edges of disturbed weed fields. The recorded occurrences of this species in the UGB occur along the Petaluma River near its confluence with Adobe Creek, and also in the Coastal Brackish Marsh area located near the wastewater treatment plant.

San Pablo song sparrow (*Melospiza melodia samuelis*) – The San Pablo song sparrow is a federal and State Species of Concern. They are non-migratory and breed in areas along the edge of bays and streams where tidal flow affects the vegetation. These birds have recorded CNDDB occurrences along the Petaluma River in the central portion of the UGB area and in the Coastal brackish Marsh located near the wastewater treatment plant.

Mammals

The pallid bat (*Antrozous pallidus*) – The pallid bat is a California species of special concern. This large bat is widely distributed in arid habitats in the western United States and northern Mexico. Like many species of bats the pallid bat is sensitive to disturbance at its roost sites. These large bats are distinctive in their foraging style, frequently taking large prey items such as crickets and scorpions from the ground. This bat species occurs in a variety of habitats such as grasslands, shrublands, woodlands, open/ dry habitats, forests, rocky outcrops, cliffs, crevices, and also buildings and hollow trees. The CNDDB presents one occurrence of the pallid bat near Kelly Creek in the southeast quarter of the UGB and in the eastern portion of the Planning Area.

Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*) - The salt marsh harvest mouse is both a federal Endangered Species and a California Endangered Species. The mouse is typically found in emergent salt marsh habitats dominated by dense growths of pickleweed. The lower sections of the Petaluma River within the planning area are characterized by areas of Northern coastal salt marsh, which contains pickleweed habitat. The CNDDB reports the occurrence of salt marsh harvest mouse within the eastern portion of the UGB and in the Petaluma River Marsh adjacent to the wastewater treatment plant.

American badger (*Taxidae taxus*) – The American badger is a State Species of Concern. In California, badgers occupy a diversity of habitats. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, and

mountain meadows near timberline are preferred. American badgers have been recorded in the UGB and also in the larger Planning Area.

Plants

Franciscan onion (*allium peninsulare var. farnciscanum*) – Franciscan onion is a federal Species of Local Concern and is listed on the CNPS 1B list. They are found in cismontane woodlands as well as valley and foothill grasslands, often on serpentine soils. The plants bloom from May to June. The CNDDB reports an occurrence of the plant within the central portion of the UGB area.

Alkali milk-vetch (*Astagalus tener var. napensis*) - Alkali milk-vetch is a CNPS 1B plant. They occur in valley and foothill grasslands, often associated with vernal pools. The plants blooming period is from March through June. The CNDDB reports an occurrence of the plant within the central portion of the UGB area; however, the CNDDB record indicates that the population was extirpated by 1992. There are no other occurrences of the plant in the Planning Area.

Sonoma spine-flower (*Chorizanthe valida*) - The Sonoma spine-flower is a California and federal Endangered Species and a CNPS List 1B Species. There is no critical habitat designated for this species. Flowers bloom from June to August. Conspicuous spiny red and white bracts (stiff scaly or leaf-like appendages) are associated with the flowers, which are clustered at the ends of stems in spiny masses. The only extant populations are in the Point Reyes National Seashore.[1] The historic range may have included Sonoma County as well as Marin. There is one CNDDB occurrence from the year 1996 of this species in the UGB area.

Yellow Larkspur (*Delphinium luteum*) - This plant is listed as federally Endangered, and is also California listed Rare. The CNPS has placed it on List 1B (rare or endangered throughout its range). Yellow larkspur grows in rocky areas within coastal scrub plant community, including areas with active rock slides, near the town of Bodega Bay in Sonoma County. The historic range was both Sonoma and Marin counties. Never widely distributed, historical populations of the species have been partially or entirely extirpated by rock quarrying activities, over-collecting, residential development and sheep grazing. The two known remaining populations near Bodega, both on private lands, total fewer than 50 plants. Because of its extreme range restriction and small population size, the plant is also vulnerable to extinction from random natural events, such as fire or insect outbreaks.

One CNDDB occurrence of this species is within the UGB, recorded in 1962. However, the record indicates the identification was questionable. Critical habitat for yellow larkspur was designated in March 18, 2003. The Planning Area is identified within the critical habitat for this species.

Round-leaved filaree (*Erodium macrophyllum*) – The round-leaved filaree is on CNPS 2 species list. They are found in cismontane woodland and valley foothill grasslands. There blooming period is from March through May. The CNDDB occurrence of this species within the central portion of the UGB is from 1880. There are no other occurrences of the plant in the UGB or Planning Area.

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1. United States Fish and Wildlife Service. Species Account for Sonoma Spineflower. http://www.fws.gov/sacramento/es/plant_spp_accts/sonoma_spineflower.htm, Accessed 2/13/06.

Marsh microseris (*Microseris paludosa*) – The Marsh microseris is a federal species of local concern and a CNPS 1B plant. They are found in a variety of habitats from conifer forests, woodland, coastal scrub and valley and foothill grasslands. The plant blooms from April through June. The CNDDB record of this species is from 1937. The records indicate that the exact location is not known, but it occurred along Stony Point Road, between Rainsville and Liberty Roads, about 0.7 miles north of central Petaluma, and in the westernmost portion of the UGB area.

Petaluma popcorn-flower (Plagiobothrys mollis var. vestitus) – The Petaluma popcorn-flower is a CNPS 1A plant. It occurs in valley and foothill grasslands and in costal marshes and swamps. The plants blooming period is in June and July. The CNDDB occurrence of this species within the central portion of the UGB is from 1880. The population may have been extirpated as early as 1932 according to the CNDDB record. There are no other occurrences of the plant in the UGB or Planning Area.

Point Reyes checkerbloom (*Sidalcea calycosa ssp. rhizomata*) – The Point Reyes checkerbloom is a federal species of local concern and is on the CNPS 1B list. The plant is associated with marshes and swamps, and bloom from April through September. The CNDDB record of the species within the central portion of the UGB is from 1880. There are no other occurrences of the plant in the UGB or Planning Area.

Showy Indian clover (*Trifolium amoenum*) – This species is federally listed as Endangered, and is on CNPS List 1B. Originally, *Trifolium amoenum* ranged from Mendocino County south to Sonoma, Marin, Alameda and Santa Clara counties, and east to Napa and Solano counties. Showy Indian clover has been extirpated from all of its 24 historically known locations in seven counties. The species was found in a variety of habitats including low, wet swales, grasslands and grassy hillsides, and sometimes grew on serpentine soils.

Considered extinct until 1993, a single showy Indian clover plant was discovered on privately-owned property in Sonoma County. That site has since been developed and the species is no longer present. One other natural population, consisting of about 200 plants, was discovered in 1996 in Marin County on privately owned property.

One recorded CNDDB occurrence of this plant species in the southernmost portion of UGB is from 1969, and another occurrence was documented within the northwestern-most portion of the Planning Area. Records indicate that the plant within the UGB was found two miles south of Petaluma, on Point Reyes Road and is likely outside of the UGB.

Special Status Species found in the Planning Area (but outside of the UGB)

The following special status species have recorded CNDDB occurrences in the Planning Area, but outside of the UGB. These species include: California tiger salamander, Western Yellow-billed Cuckoo, Pappose Tarplant, Contra Costa Goldfield, Marin knotweed, Soft bird's-beak, and Jepson's Leptosiphon.

California Tiger Salamander (*Ambystoma Californians*) – The California tiger salamander is a federally Threatened species, and a California Species of Special Concern. The California tiger salamander is most commonly found in annual grassland habitat, but also occurs in grassy under story of valley-foothill hardwood habitats, and uncommonly along stream courses in valley-foothill riparian habitats. The species occurs from near Petaluma east through the Central Valley to Yolo and Sacramento counties and south to Tulare County, and from the vicinity of San Francisco Bay south at least to Santa Barbara County. During breeding migrations, individuals

are sometimes found under surface objects such as rocks and logs. Postmetamorphic juveniles retreat to small-mammal burrows after spending a few hours or days in mud cracks near water or tunnels constructed in soft soil. Aquatic larvae seek cover in turbid water, clumps of vegetation, and other submerged debris.

Critical habitat for the California tiger salamander was proposed in August 2, 2005 (Federal Register 70:44301-44322), proposing 74,223 acres of critical habitat in the Santa Rosa Plain in central Sonoma County, bordered on the west by the Laguna de Santa Rosa, on the south by Skillman Road northwest of Petaluma, on the east by the foothills, and on the north by Windsor Creek. While there are no known occurrences of this species within the UGB area, the CNDDB contains records of this species in the northwestern portion of the Planning Area. Further, a portion of the UGB was originally included within thisproposed critical habitat area, but later removed. Recently, the U.S. Fish and Wildlife Service declared that a consensus-driven Santa Rosa Plain Conservation Strategy is the key to the protection and recovery of the endangered California tiger salamander in Sonoma County. While no areas within the UGB are affected by this species, a discussion regarding the Draft Santa Rosa Plain Conservation Strategy plan has been provided for purely informational purposes. CEQA analysis of project consistency with the SRPCS is not required.

Pappose tarplant (*Centromadia parryi ssp. parryi*) – The Pappose tarplant is a CNPS 1B plant. It occurs in coastal prairies, meadows and seeps, marshes and swamps and also in valley and foothill grasslands with mesic soils. The plants bloom from May through November. The CNDDB occurrence for this plant states that its exact location is not known but is in the vicinity of Willow Brook, approximately one mile southwest of Penngrove.

Western yellow-billed cuckoo (*Coccyzus americanus occidentailis*) – The Western yellow-billed cuckoo is a State Endangered Species, and is a candidate for listing under the federal Endangered Species Act. The birds nest in dense riparian areas usually in willows or cottonwoods with an under story of blackberries, nettles and wild grape. The CNDDB occurrence of this species is on the northern outskirts of the planning area. Impacts related to the implementation of the GP and development of the opportunity areas would not result in significant impact to this species because it is well outside of the UGB.

Soft bird's-beak (*Cordylanthus mollis ssp. mollis*) – Soft bird's beak is a federally Endangered Species, a California Rare plant, and is a CNPS 1B plant. Soft bird's-beak grows in the coastal salt marshes and brackish marshes from northern San Francisco Bay to Suisun Bay in Napa, Solano, and Contra Costa counties. Much of its habitat has been lost or fragmented due to development.

There are no CNDDB recorded occurrences of this plant in the UGB, however, suitable habitat exist in the Planning Area along the Petaluma River Marsh.

Point Reyes bird's-beak (*Cordylanthus maritimus ssp. palustris*) – Point Reyes bird's beak is a Federal species of Concern and is on CNPS List 1B. This plant grows in the coastal salt marshes and brackish marshes. Much of its habitat has been lost or fragmented due to development. There are no CNDDB recorded occurrences of this plant in the UGB, however, suitable habitat exist in the Planning Area along the Petaluma River Marsh.

Contra Costa goldfields (*Lasthenia conjugens*) – Contra Costa goldfields is a federally Endangered Species and a CNPS 1B plant. The plant is often found in vernal pools, swales, and low depressions in grassy openings in woodland habitats. The plant blooms from March through

June. The CNDDB record of this plant is located east of Highway 116 and west of Stage Gulch Road in the easternmost boundary of the Planning Area.

Marin knotweed (*Polygonum marinense*) – Marin knotweed is a federal Species of Local Concern, and is on the CNPS 3 list. The plant is found in marshes and swamps, and blooms from October through April. The CNDDB record of this species is located in the salt marsh area of the Petaluma River, at the southeast tip of the Planning Area.

Jepson's Leptosiphon (Linathus jepsonii) – Jepson's linanthus is a federal Species of Local Concern and a CNPS 1B plant. It is found in chaparral and cismontane woodland habitats and blooms from April through May. The CNDDB occurrence state the plant was found 4.5 miles northeast of Penngrove on the west slope of Sonoma Mountain.

REGULATORY SETTING

Policies and regulations that are pertinent to the proposed General Plan are identified below. The proposed plan is considered to be consistent and compatible with these policies and regulations unless stated in the impact analysis that follows.

Federal

Endangered Species Act (FESA)

The FESA of 1973 provides legal protection for plant and animal species in danger of extinction, and requires definitions of critical habitat and development of recovery plans for specific species. Section 3 of the FESA defines an endangered species as "any species, including subspecies, in danger of extinction throughout all or a significant portion of its range"; and a threatened species as any species "likely to become endangered within the foreseeable future throughout all or a significant portion of its range." "Federally listed" or "listed" indicates that a species has been designated as endangered or threatened through publication of a final rule in the Federal Register. Endangered and threatened species listed under Section 4 of the FESA receive the full protection of the FESA. Proposed endangered and threatened species are those for which a proposed regulation, but not a final rule, has been published in the Federal Register. Proposed species are granted limited protection, while candidate species and species of special concern are afforded no protection under the FESA.

Projects that would result in adverse effects on federally-listed threatened or endangered species are required to consult with, and mitigate through consultation with, the USFWS. The objective of consultation is to determine whether the project would adversely affect a protected species or its designated critical habitat, and to identify mitigation measures to avoid or reduce impacts to the species. This consultation can be pursuant to either Sections 7 or 10 of the FESA. Section 7 consultation is required when a federal agency is involved in project approval, funding, or permitting. Section 10 consultation is required when no federal agencies are involved with the project.

Section 7 of the FESA requires federal agencies to make a finding on the potential to jeopardize the continued existence of any listed species potentially impacted by all federal actions, including the approval of a public or private action, such as the issuance of a permit pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the CWA.

Section 9 of the FESA prohibits the take of any member of an endangered species. Take is defined by the FESA as "...to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." USFWS has further defined the terms harass and harm. Harass is defined as follows:

"...an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering."

Harm is defined to include the following:

"...significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering."

Section 10(a) of the FESA permits the incidental take of listed species if the take is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Migratory Bird Treaty Act (MBTA) of 1918

The MBTA regulates or prohibits the taking, killing, possession of, or harm of migratory bird species listed in Title 50 Code of Federal Regulations (CFR) Section 10.13. It is an international treaty for the conservation and management of bird species that migrate through more than one country, and is enforced in the United States by the USFWS. Hunting of specific migratory game birds is permitted under the regulations listed in Title 50 CFR 20. The MBTA was amended in 1972 to include protection for migratory birds of prey (raptors). Six families of raptors occurring in North America were included in the amendment:

Accipitridae (kites, hawks, and eagles);

Cathartidae (New World vultures);

Falconidae (falcons and caracaras);

Pandionidae (ospreys);

Strigidae (typical owls); and

Tytonidae (barn owls).

All species and subspecies of the families listed above are protected under the amendment.

Federal Clean Water Act

Section 404

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Section 404 of the CWA regulates activities that result in discharge of dredged or fill material into waters of the United States. The United States Army Corps of Engineers (Corps) is responsible for permitting certain types of activities affecting wetlands and "other waters of the United States." Under Section 404 of the CWA, the Corps has the authority to regulate activity that could discharge fill or dredge material or otherwise adversely modify wetlands or other waters of the U.S. The Corps implements the federal policy

embodied in Executive Order 11990, which, when implemented, is intended to result in no net loss of wetland values or acres.

Section 401

The State Water Resources Control Board (SWRCB) has authority over wetlands through Section 401 of the CWA, as well as the Porter-Cologne Act, California Code of Regulations Section 3831(k), and California Wetlands Conservation Policy.

The CWA requires that an applicant for a Section 404 permit (to discharge dredged or fill material into waters of the United States) first obtain a CWA, Section 401 water quality certification from the State Water Resources Control Board (SWRCB) or one of the nine Regional Water Quality Control Boards (RWQCB). A request for certification or waiver is submitted to the State or regional board at the same time that an application is filed with the Corps. The water board has 60 days to review the application and act on it. Because no Corps permit is valid under the CWA unless "certified" by the State, these boards may effectively veto or add conditions to any Corps permit.

State

California Endangered Species Act (CESA)

The California Department of Fish and Game (CDFG) administer a number of laws and programs designed to protect fish and wildlife resources. Principal among these is the California Endangered Species Act of 1984 (Fish and Game Code Section 2050), which regulates the listing and take of State-endangered and State-threatened species. CESA declares that deserving species will be given protection by the State because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

Species listed under CESA cannot be taken without adequate mitigation and compensation. The definition of take under CESA is the same as described above for the federal ESA. However, based on findings of the California Attorney General's Office, take under CESA does not prohibit indirect harm by way of habitat modification. Typically, the CDFG implements endangered species protection and take determinations by entering into management agreements (Section 2081 Management Agreements) with project applicants.

CDFG maintains lists of Species of Special Concern, based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. Species of Special Concern do not receive protection under the CESA or any section of the California Fish and Game Code, and do not necessarily meet CEQA Guidelines Section 15380 criteria as rare, threatened, endangered, or of other public concern. Like federal Species of Concern, the determination of significance for California Species of Special Concern must be made on a case-by-case basis. Designation of Species of Special Concern is intended by CDFG to be used as a management tool for consideration in future land use decisions.

Fish and Game Code - Sections 3503, 3503.5, 3513

Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Fish and Game Code Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act. These regulations could require that elements of the proposed project (particularly vegetation removal or construction near nest trees) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by CDFG and/or USFWS.

Fish and Game Code B Sections 3511, 4700, 5050, and 5515

Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code designate certain species as "fully protected." Fully protected species, or parts thereof, may not be taken or possessed at any time, and no provision of the California Fish and Game Code or any other law may be construed to authorize the issuance of permits of licenses to take any fully protected species. No such permits or licenses heretofore issued may have any force or effect for any such purpose, except that the California Fish and Game Commission may authorize the collecting of such species for necessary scientific research. Legally imported and fully protected species or parts thereof may be possessed under a permit issued by CDFG.

CDFG Lake and Streambed Alteration Agreements

Under sections 1600-1616 of the California Fish and Game Code, the CDFG regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. The limits of CDFG's jurisdiction are defined in the code as the . . . "bed, channel or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit..." (Section 1601).

This broad definition gives the CDFG great flexibility in deciding what constitutes a river, stream, or lake. In practice, the CDFG usually marks its jurisdictional limit at the top of the stream or bank, or at the outer edge of the riparian vegetation, whichever is wider.

Native Plant Protection Act

The California Native Plant Protection Act (California Fish and Game Code Sec. 1900-1913) prohibits the taking, possession, or sale within the State of any rare, threatened or endangered plants as defined by CDFG. This protection would apply to any plants with a State designation of rare, threatened, or endangered. Project impacts to these species would be considered "significant" if the species are known to occur within the area of disturbance associated with construction of the project, or "potentially significant" if the species has a high potential to occur within the area of disturbance.

California Environmental Quality Act

Although threatened and endangered species are protected by specific federal and State statutes, CEQA Guidelines Section 15380(b) provides that a species not federally- or State-listed may still

be considered rare if it can be shown to meet certain specified criteria. These criteria have been modeled after definitions in the FESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. Section 15380(b) requires public agencies to undertake reviews to determine if projects would result in significant effects on species not listed by either the USFWS or CDFG (i.e., candidate species). Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

Oak Woodlands Conservation Act

The Oak Woodlands Conservation Act was added to the State of California Public Resources Code (Section 21083.4) on February 18, 2004 and requires that a County determine whether a project in its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. A County must then require one or more alternatives to mitigate the significant effect of the conversion of oak woodlands. This Act exempts specified activities from its requirements, including:

1. Projects undertaken pursuant to an approved Natural Community Conservation Plan (NCCP) or approved sub-area plan within an approved Natural Community Conservation Plan that includes oaks as a covered species or that conserves oak habitat through natural community conservation preserve designation and implementation and mitigation measures that are consistent with this section.
2. Affordable housing projects for lower income households, as defined pursuant to Section 50079.5 of the Health and Safety Code, that are located within an urbanized area, or within a sphere of influence as defined pursuant to Section 56076 of the Government Code.
3. Conversion of oak woodlands on agricultural land that includes land that is used to produce or process plant and animal products for commercial purposes.
4. Projects undertaken pursuant to Section 21080.5 of the Public Resources Code.

Local

Petaluma River Access and Enhancement Plan, 1996

The Petaluma River Access and Enhancement Plan was created in 1996 by the City as a tool to making the Petaluma River the keystone feature of Petaluma. The objective of the plan when it was created was to elaborate on the Petaluma General Plan 1987-2005 regarding the river and the properties abutting it. The plan contains many guidelines for habitat management including guidelines for:

Biological Restoration Plans;

Tree Protection Plans for Development Around Oaks and Mature Riparian Species;

Exotic Vegetation Removal and Control Plans;

Bank Stabilization and Erosion Control Plans;

Storm Water Pollution Prevention Plans;

Channel Maintenance Guidelines;

Landscape Maintenance of Native Plants;

Native Oak Establishment; and

Flood Control Channel Design.

Adobe Creek Restoration Plan and Management Program, 1996

The Adobe Creek Restoration Plan and Management Program was developed by the City of Petaluma and the Sonoma County Water Agency to enhance, restore, and manage Adobe Creek. The plan provides guidelines for channel designs and vegetation management that promote the development of a mature riparian canopy to enhance wildlife function, while maintaining adequate capacity for flood control. One of the goals of the management guidelines is to show that careful hand pruning of willows and other in-stream plants during the initial restoration period can lead the way to a more self-sustaining system that will reduce the long-term maintenance costs of flood control channels while improving the habitat for fish and wildlife. The plan also seeks to integrate schools, resource agencies, public agencies, local residents, and community organizations in a focused effort to restore Adobe Creek. The plan focuses on two stream reaches of Adobe Creek, the McDowell Reach, south of Lakeville Highway; and Sartori Reach, north of Sartori Drive.

Draft Santa Rosa Plain Conservation Strategy

The Santa Rosa Plain Conservation Strategy was developed by the Santa Rosa Plain Conservation Strategy Team, made up of representatives of federal, State, and local government agencies and other interested parties. The purpose of the Conservation Strategy is to create a long term conservation program sufficient to mitigate potential adverse effects of future development on the Santa Rosa Plain (Plain) to listed species. The program would contribute to the recovery of California tiger salamander (CTS), Burke's goldfield, Sonoma sunshine, Sebastopol meadowfoam, and the many flowered navarretia and the conservation of their sensitive habitat. The objective of the Conservation Strategy is to accomplish the above in a manner that protects stakeholders (both public and private) land use interests, and to support issuance of an authorization for incidental take of CTS and listed plants that may occur in the course of carrying

The Strategy framework provides several key components:

The basis for future regulatory actions to be implemented by the appropriate agencies;

Appropriate biological information for the listed species that facilitates the preparation of a programmatic biological opinion;

A mechanism for processing permits for projects within the potential range of the listed species – providing communities and stakeholders with consistency, timeliness and certainty;

Maps of impact and conservation areas;

Mitigation ratios for impacts; and

Guidelines for (i) translocation, (ii) conservation area management plans, (iii) adaptive management, (iv) implementation of strategy, and (v) securing potential funding.

IMPACT ANALYSIS

Significance Criteria

Impacts of buildout of the proposed General Plan would be significant if they:

> Have a substantial adverse effect, either directly or though habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U/S. Fish and Wildlife Service;
>
> 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;
>
> Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service;
>
> 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;
>
> 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.

Impacts in any of the above categories would be considered unavoidable significant effects of the projects if they could not be (a) eliminated, (b) avoided or minimized by redesign or relocation of some components of the projects, (c) reduced to a less-than-significant level, or (d) compensated for by replacement of equal habitat extent and value.

Methodology & Assumptions

Potential impacts of the implementation of the General Plan on plant and animal life were identified by first comparing the proposed development areas with habitat and species maps and information. For those areas where habitat may be lost, habitat requirements of the various species were compared to the habitat available on and adjacent to the planning area. A determination was then made as to what effect the loss of that potential habitat would have on the species.

Summary of Impacts

Many of the sites proposed for development under the proposed General Plan areas are located along or near the Petaluma River corridor. Many special status plant and animal species or their habitat occur along the River. Species which could be impacted by proposed development in this area include, but are not limited to: pallid bat, salt marsh harvest mouse, California Black rail, San Pablo song sparrow, salt marsh common yellowthroat, Steelhead, Sacramento Splittail, California Tiger Salamander, foothill yellow-legged frog, California Red-legged frog, western pond turtle,

Marsh microseris, Point Reyes Checkerbloom, Alkali Milk-Vetch, Franciscan Onion, Petaluma Popcorn Flower, Round-leaved Filaree, Sonoma Spine-flower, Showy Indian clover, and Yellow larkspur. Furthermore, development could also result in impacts on wetlands, riparian habitat, oak woodland or "waters of the US".

Some development that may occur under the proposed General Plan is located along the outskirts of the urbanized areas in previously undeveloped sites, but this would not result in the exclusion of species from their normal migration routes. No development is proposed directly within the channel of any watercourse, and therefore, would not interfere with the movement of any fish species. Therefore, development within the UGB would not interfere with the movement of fish or other wildlife species that migrate through the already urbanized areas of the City, and impacts would be less than significant.

Impacts and Mitigation Measures

Impact 3.8-1 Implementation of the proposed General Plan could result in substantial adverse effects on special status fish species or their habitat. (Less than Significant)

Proposed development immediately adjacent to the Petaluma River or Adobe Creek could result in adverse impacts on Steelhead, Sacramento Splittail, or other special status fish species if construction activities associated with proposed developments were to occur within or adjacent to the stream channels. This would be a potentially significant impact. Compliance with state law through obtaining required permits and agreements (listed below) as well as policies in the proposed General Plan (listed below) would reduce this impact to a less than significant level. Further, as part of the development review process, site-specific biological resources assessments are required to consider the impacts on riparian and aquatic resources and the habitats they provide for invertebrates, fish, amphibians, reptiles, birds, mammals, and plants. If development is located outside these ecologically sensitive regions, no site-specific assessment of biological resources is necessary. Appropriate mitigation measures to reduce impacts to sensitive habitats and special status species would be imposed on a project-by-project basis according to Petaluma's environmental review process and consultation with appropriate State and federal regulatory agencies.

Required Regulations:

> If impacts on wetlands and "other waters of the U.S." cannot be avoided, the project developer for future individual projects shall obtain a CWA, Section 404 Wetlands Fill permit from the Corps and a Section 401 Water Quality Certification from the California Regional Water Quality Control Board (RWQCB) prior to any construction activities that may impact onsite wetlands or "other waters of the United States." Restoration of affected wetlands can be accomplished through on-site enhancement of existing wetlands and "other waters of the U.S.," through purchase of the appropriate wetland mitigation credits at an approved mitigation bank within the Project's Service Area, or through fee-title acquisition and management of mitigation lands within the region.
>
> Project proponents for future individual projects shall obtain a Section 1601 Streambed Alteration Agreement from the CDFG prior to any construction activities that may result in any disturbance to stream corridors. Specific mitigation measures shall be developed

during consultation with the CDFG, but may include measures such as using bridges instead of culverts, erosion control and bank stabilization measures, and restoring stream corridor habitat damaged from project construction.

Proposed General Plan Policies that Reduce the Impact

4-P-1 Protect and enhance the Petaluma River and its tributaries through a comprehensive river management strategy of the following programs:

A. Implement the Petaluma River Access and Enhancement Plan including expanded improvements identified through project specific environmental assessment.

B. Institute and maintain public access to and along the entire length (on one or both sides), of the river while ensuring that natural resources and river dependent industry are protected.

C. Require design review to address the relationship and stewardship of that project to the river or creek for any development on sites with frontage along the river and creeks, identified on Figure 1-3 (of the General Plan).

D. Create setbacks for tributaries extending a minimum of 50 feet outward from the top of each bank, with extended buffers where significant habitat areas, vernal pools, or wetlands exist. Development shall not occur within this setback, except as part of greenway enhancement (for example, trails and bikeways). Where there is degradation within the zone, restoration of the natural creek channels and riparian vegetation is mandatory.

E. Facilitate compliance with Phase II standards of the National Pollutant Discharge Elimination System (NPDES) to improve the water quality and aesthetics of the river and creeks.

F. Work with the State Lands Commission, State Department of Fish and Game, the Sonoma County Water Agency, and other jurisdictional agencies on preservation/enhancement of the Petaluma River as a component of reviewing major development along the River.

G. Expand the planting and retention of trees along the upper banks of the river and creeks to reduce ambient water temperature and shade out invasive, non-native species.

4-P-3 Conserve wildlife ecosystems and sensitive habitat areas in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation.

A. Utilize Technical Memorandum 3: Biological Resources Review as a baseline document, expanding to address project specific impacts.

4-P-4 Protect special status species and supporting habitats within Petaluma, including species that are State or Federal listed as endangered, threatened, or rare (shown in Table 4.1-1 of the General Plan).

A. As part of the development review process, site-specific biological resource assessments are required to consider the impacts on riparian and aquatic resources and the habitats they provide for invertebrates, fish, amphibians, reptiles, birds, mammals, and plants. If development is located outside these ecologically sensitive regions, no site-specific assessment of biological resources may be necessary. Appropriate mitigation measures to reduce impacts to sensitive

habitats and special status species would be imposed on a project-by-project basis according to Petaluma's environmental review process.

B. Review all development proposals along the navigable portion of the river to determine that they are designed to encourage long-term retention of river-dependent uses to the extent feasible.

4-P-5 Continue to support rural land use designations and Agricultural Best Management Practices within the Sonoma County General Plan.

A. Coordinate with Sonoma County's Agricultural Preservation and Open Space District, Permit and Resource Management Department, and Water Agency to protect riparian corridors and critical biological habitats as well as to reduce cumulative impacts on sensitive watershed areas outside of the city limits.

B. Work with County, State and federal agencies to ensure that development within the Planning Referral Area does not substantially affect State or federally listed rare, endangered, or threatened species or their habitats. Require assessments of biological resources prior to approval of any development in or within 300 feet of ecologically sensitive areas.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-2 Implementation of the proposed General Plan could result in substantial adverse effects on California Brackishwater Snail or its habitat. (Less than Significant)

According to CNDDB records, the California Brackishwater Snail occurs along the Petaluma River, immediately adjacent to the Ellis Creek water treatment plant. Although figure 3.8-1 shows the Coastal Brackish Marsh habitat surrounding portions of the Ellis Creek water treatment plant, this habitat actually extends into the treatment plant's water recycling treatment areas. The treatment plant includes a densely vegetated wetland for algae removal, and also polishing wetlands. Operation of the water treatment plant will not result in significant impacts to the species found in the brackish water habitat, and may in fact enhance wildlife habitat in the immediate area. Impact are considered less-than-significant.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-3 Implementation of the proposed General Plan could result in substantial adverse effects on the salt marsh harvest mouse or its habitat. (Less than Significant)

The salt marsh harvest mouse occurs in marsh habitats along the Petaluma River. This species has the potential to be impacted by proposed projects that occur within or adjacent to their habitat. As mentioned previously, operation the Ellis Creek water treatment plant could enhance wildlife habitat in the Coastal Brackish Marsh located in the southeast portion of the planning area. Therefore, potential impacts to the saltmarsh harvest mouse at this location would be considered

less than significant. However, development of the opportunity areas within the UGB has the potential to impact the mouse if construction or development occurs within marsh habitats. Compliance with state law through obtaining required permits and agreements (listed above in impact 3.8-1) as well as policies in the proposed General Plan (listed below) would reduce this impact to a less than significant level. Further, as part of the development review process, site-specific biological resources assessments are required to consider the impacts on sensitive habitats and special status species. If development is located outside these sensitive habitat areas, no site-specific assessment of biological resources is necessary. Appropriate mitigation measures to reduce impacts to sensitive habitats and special status species would be imposed on a project-by-project basis according to Petaluma's environmental review process and consultation with appropriate State and federal regulatory agencies.

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-3, Policy 4-P-4, and Policy 4-P-5 as stated above in Impact 3.8-1.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-4 Implementation of the proposed General Plan could result in substantial adverse effects on special status bat species or their habitat. (Less than Significant)

The UGB identified in Figure 2-1 is located within the known range of the pallid bat (*Antrozous pallidus*), which is a California species of special concern. The Planning Area has numerous large trees, cliffs, and buildings which may provide cavities suitable for pallid bat roosting, and suitable foraging habitat as well. These bats have the potential to be impacted by the development that would occur under the proposed General Plan, especially projects located in close proximity to wooded or riparian areas. Construction activities such as building demolition, tree removal, could destroy habitat for these species. Impacts to this species resulting from development within the Opportunity Areas would be potentially significant. However, compliance with State, Federal and local laws and regulations, which could require focused surveys and relocation of bats (if present) or obtaining required permits and agreements; and the applicable policies contained in the General Plan would reduce this impact to a less than significant level. Under the City's current environmental review process, a more detailed analysis will be required of future development project proponents, on a project-by-project basis, to further determine the potential for adverse impacts to bats. No mitigation measures are required beyond the compliance and coordination actions required above.

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-3, Policy 4-P-4, and Policy 4-P-5 as stated above in Impact 3.8-1.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-5 Implementation of the proposed General Plan could result in substantial adverse effects on American badger or its habitat. (Less than Significant)

American Badgers have known CNDDB occurrences within the UGB, and have the potential to occur in proposed Opportunity Areas along the outskirts of the UGB. Impacts to this species resulting from construction activities associated with proposed development would be a significant impact. However, compliance with State, Federal and local laws and regulations, which could require focused surveys or obtaining required permits and agreements; and the applicable policies contained in the General Plan would reduce this impact to a less than significant level. Under the City's current environmental review process, a more detailed analysis will be required of future development project proponents, on a project-by-project basis, to further determine the potential for adverse impacts to sensitive status species including American badger.

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-3, Policy 4-P-4, and Policy 4-P-5 as stated above in Impact 3.8-1.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-6 Implementation of the proposed General Plan could result in substantial adverse effects on western pond turtle, California tiger salamander, foothill yellow-legged frog, California red-legged frog, or their habitat. (Less than Significant)

Western pond turtles occur throughout the regions both with the UGB and in the Planning Area. Development of the Opportunity areas has the potential to impact western pond turtles if the proposed project occurs within or adjacent to suitable wetland or ponds which could support the turtle. Additionally, the UGB identified in Figure 2-1 is located within the known range of several special status amphibian species including: California tiger salamander, foothill yellow-legged frog, California red-legged frog, and western spadefoot toad. These amphibians have the potential to be impacted by the development within the UGB, especially projects located in close proximity to riparian areas. Construction activities such as vegetation clearing, grading, and other site clearing operations could destroy habitat for these species. Compliance with state law through obtaining required permits and agreements (listed above in impact 3.8-1) as well as policies in the proposed General Plan (listed below) would reduce this impact to a less than significant level. Further, as part of the development review process, site-specific biological resources assessments are required to consider the impacts to sensitive habitats and special status species. If development is located outside these sensitive habitat areas, no site-specific assessment of biological resources is necessary. Appropriate mitigation measures to reduce impacts to sensitive habitats and special status species would be imposed on a project-by-project basis according to Petaluma's environmental review process and consultation with appropriate State and federal regulatory agencies.

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-3, Policy 4-P-4, and Policy 4-P-5 as stated above in Impact 3.8-1.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-7 Implementation of the proposed General Plan could result in substantial adverse effects on nesting raptor species or their habitat. (Less than Significant)

Several raptor species have the potential to occur in some of the opportunity areas identified in the GP. These species could include, but are not limited to; Ferruginous Hawk, white-tailed kite, red-tailed hawk, red shouldered hawk. Nesting habitat for non-listed special-status raptor species occurs throughout Petaluma. Raptors could potentially utilize the large trees within the City. Disturbances from construction activities could cause nest abandonment and death of young or loss of reproductive potential at active nests located on or near the project sites. Raptors and their nests and eggs are protected under CDFG Code 3503.5.

The applicable General Plan policies, Policy 4-P-1, Policy 4-P-3, Policy 4-P-4, Policy 4-P-5 as stated above in Impact 3.8-1, and Policy 4-P-6 below would reduce impacts to birds. In addition, CDFG Code 3503 protects the needless destruction of nests or eggs of all bird species, except English sparrows and European Starlings. Subsequent development projects would be required to comply with the Fish and Game Code and the Migratory Bird Treaty Act, which would generally insure that no significant impacts involving nesting birds would occur. Such regulations would require surveys protection during the breeding season on a project-by-project basis should such species or their habitat exist on-site. No mitigation measures are required beyond the compliance and coordination actions required above.

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-1, Policy 4-P-3, Policy 4-P-4, and Policy 4-P-5 as stated above in Impact 3.8-1, and Policy 4-P-6 below.

4-P-6 Improve air quality through required planting of trees along streets and within park and urban separators, and retaining tree and plant resources along the river and creek corridors.

A. Require planting of trees at a ratio of five (24" box or larger) for every significant tree removed at a project site. Replacement planting may occur on the project sire or on a publicly owned area, with long-term maintenance assured.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-8 Implementation of the proposed General Plan could result in substantial adverse effects on California black rail bird, San Pablo song sparrow, Saltmarsh common yellow throat or other special status bird species. (Less than Significant)

The California black rail bird, San Pablo song sparrow, and Saltmarsh common yellow throat generally occur in the marsh habitats along the Petaluma River. Development along the River and within suitable habitat for any of these species has the potential to result in a significant impact to those species. Compliance with state law through obtaining required permits and agreements (listed above in impact 3.8-1 and as stated in CDFG Code 3503) as well as the applicable General Plan policies, Policy 4-P-1, Policy 4-P-3, Policy 4-P-4, Policy 4-P-5 (as stated above in Impact 3.8-1), and Policy 4-P-6 (as stated in impact 3.8-7 above) would reduce impacts to special status

birds species. Further, all development projects would be required to comply with the Fish and Game Code and the Migratory Bird Treaty Act, which would generally insure that no significant impacts involving special status or nesting birds would occur. Appropriate mitigation measures to reduce impacts to sensitive habitats and special status bird species would be imposed on a project-by-project basis according to Petaluma's environmental review process and consultation with appropriate State and federal regulatory agencies. No mitigation measures are required beyond the compliance and coordination actions as stated above.

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-1, Policy 4-P-3, Policy 4-P-4, Policy 4-P-5, and Policy 4-P-6 as stated above in Impact 3.8-7.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-9 Implementation of the proposed General Plan could result in substantial adverse effects on oak woodland and special status plant species or their habitat. (Less than Significant)

Many of the future development areas are located along the western portion of the UGB, where some oak woodland habitat exists. Development of projects in these areas could result in the loss of individual oak trees or small stands of oaks. Additionally, several special status plant species are known to occur or have suitable habitat within the UGB and the proposed General Plan has the potential to alter their habitats (Figure 3.8-1). These species include: Marsh microseris, Point Reyes Checkerbloom, Alkali Milk-Vetch, Franciscan Onion, Petaluma Popcorn Flower, Round-leaved Filaree, Sonoma Spine-flower, Showy Indian clover, and Yellow larkspur. Land clearing activities associated with construction of proposed projects under the proposed General Plan have the potential to destroy individual plant species. Compliance with State, Federal and local laws and regulations, which could require focused surveys to be conducted using CDFG botanical survey guidelines (CDFG, 2000), combined with appropriate mitigation measures that reduce impacts to special status plant species or their habitat would be imposed on a project-by-project basis according to Petaluma's environmental review process. The General Plan policies listed below further ensure that less than significant impacts to special status plant species would occur.

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-1, Policy 4-P-3, Policy 4-P-4, Policy 4-P-5, and Policy 4-P-6 as stated above in Impact 3.8-7.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-10 Implementation of the General Plan could adversely affect riparian areas, wetlands and/or "other waters of the United States." (Less than Significant)

As stated previously, the location of projects that could be developed under the proposed General Plan include areas along or near the Petaluma River corridor. Development in previously undeveloped sites or sites directly adjacent to a watercourse has the potential to adversely affect riparian habitat, wetlands, or "other waters of the U.S.". Alterations of the flow, bed, channel, or

bank of California streams from the construction of bridges, culverts, pipelines, and/or other project infrastructure that could result are regulated pursuant to Sections 1600-1616 of the California Fish and Game Code. The loss of wetlands and "other waters of the U.S." and potential alterations to the bed or banks of stream courses within the planning area would be a potentially significant impact. Compliance with state law through obtaining required permits and agreements and the applicable General Plan policies, Policy 4-P-1, Policy 4-P-3, Policy 4-P-4, Policy 4-P-5 as stated above in Impact 3.8-1 would reduce impacts to riparian areas, wetlands and/or "other waters of the United States."

Proposed General Plan Policies that Reduce the Impact: Policy 4-P-3, Policy 4-P-4, and Policy 4-P-5 as stated above in Impact 3.8-1.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-11 Implementation of the proposed General Plan would not interfere with the movement of fish or wildlife species. (Less than Significant)

The Opportunity Areas that could be developed as part of implementation of the proposed General Plan are generally surrounded by urbanized areas. Some development may occur along the outskirts of the urbanized areas in previously undeveloped sites, but this would not result in the exclusion of species from their normal migration routes. No development is proposed directly within the channel of any watercourse, and therefore, would not interfere with the movement of any fish species. Therefore, development within the UGB would not interfere with the movement of fish or other wildlife species that migrate through the already urbanized areas of the City, and impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Impact 3.8-12 Implementation of the proposed General Plan may conflict with the provisions of the Draft Santa Rosa Plain Conservation Strategy. (Less than Significant)

It is important to note that at the drafting of this document the Draft Santa Rosa Plain Conservation Strategy (SRPCS) has not been approved or adopted, nor has an implementation agreement for the SRPCS been drafted and the SRPCS has yet to go through CEQA review. CEQA requires a consistency analysis for "*adopted* Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or State habitat conservation plans." While the outcome of the SRPCS in unknown at this time, and it is unclear whether it will be adopted, a discussion regarding the Draft plan is provided below for purely informational purposes. CEQA analysis of project consistency with the SRPCS is not required as the SRPCS has not been adopted at this time.

Approximately 35 acres of the northwestern-most portion of the UGB are located within the southeastern-most portion of the Draft Santa Rosa Plain Conservation Strategy (SRPCS) Area.

One currently undeveloped future development area, comprising 2.7 acres, is located within Potential CTS Range, but outside of the Conservation and Preserve Areas – as indicated in Figure 2, *Conservation Area Overview*, of the SRPCS. The remaining 32.3 acres are currently developed as business park and agricultural, and would remain as such as no new land use designations are proposed for these areas. The purpose of the conservation areas is to insure that preservation occurs throughout the distribution of the species. The designation of conservation areas is based upon the following factors: 1) known distribution of CTS, 2) the presence of suitable CTS habitat, 3) presence of large blocks of natural or restorable land, 4) adjacency to existing preserves, 5) known location of the listed plants, and 6) future development areas established by UGBs and city general plans. The conservation area boundaries identify areas where mitigation for project-related impacts to the listed species and vernal pools should be directed. Conservation areas are integral to the conservation and recovery of the listed species by directing preservation efforts into the most important areas, as well as to ensure well distributed populations. The acreage of preserves in the conservation areas includes two categories: 1) existing preserves that are secure, and 2) pending preserves. Existing preserves were established primarily to mitigate impacts to listed plants and wetlands. Pending preserves are defined as preserves that are proposed as mitigation in CEQA documents currently being evaluated, preserves in pending Section 7 consultations or in Corps of Engineers applications, or proposed mitigation banks that have a Banking Enabling Instrument in review. Development in these areas could conflict with the guidelines in the Draft Conservation Strategy, which would be considered a significant impact if the SRPCS were approved and adopted.

Mitigation Measures

No mitigation measures are required.

3.9 NOISE

This section provides a description of general noise and groundborne vibration principles, as well as a discussion of sources of noise and groundborne vibration, sensitive receptors, and noise levels in Petaluma. This section also discusses local and State regulations that seek to abate noise or reduce noise exposure.

ENVIRONMENTAL SETTING

Noise Definition and Measurement

Sound is created when objects vibrate and produce pressure variations that move rapidly outward into the surrounding air. The main characteristics of these air pressure waves are amplitude, which we experience as a sound's "loudness" and frequency, which we experience as a sound's "pitch." The standard unit of sound amplitude is the decibel (dB), which is a measure of the physical magnitude of the pressure variations relative to the human threshold of perception. The human ear's sensitivity to sound amplitude is frequency-dependent and so a modification is usually made to the decibel to account for this; A-weighted decibels (dBAs) incorporate human sensitivity to a sound's frequency as well as its amplitude.

Noise is generally defined as "unwanted" sound, aspects of which can negatively affect the physiological or psychological well-being of individuals or communities. A typical noise environment consists of a base of steady ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. Noise at excessive levels can affect our living environment and quality of life. Table 3.9-1 lists noise levels commonly encountered in environmental or occupational situations.

Several quantitative indicators are commonly used to gauge the likelihood that environmental noise would have an adverse effect on a community. These indicators consider that the most disruptive aspects of noise are strongly associated with the average acoustical energy content of the sound over the time it occurs and/or with the time of day when the sound occurs. The indicators used in this EIR are as follows:

> L_{eq}, the equivalent energy noise level, is the average acoustic energy content of noise, usually measured over one hour. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. L_{eq} values do not include a penalty for noise that might occur at night.
>
> L_{dn}, the day-night average noise level, is a 24-hour average L_{eq} with a 10 dBA "penalty" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for the greater noise sensitivity of people during the night.
>
> CNEL, Community Noise Exposure Level, is a 24-hour average with a 5 dBA penalty added to noise during the evening from 7:00 p.m. to 10:00 p.m. and a 10 dBA penalty added during the nighttime from 10:00 p.m. to 7:00 a.m. The CNEL is very similar to the L_{dn}, with the CNEL about 0.2 to 1 decibel greater than the L_{dn}.

Table 3.9-1: Typical Sound Levels Measured in the Environment and Industry

Noise Source (Distance)	*A-Weighted Sound Level (dBA)*	*Subjective Impression*
Civil Defense Siren (100')	130	Pain Threshold
Jet Takeoff (200')	120	
Rock Music Concert (50')	110	
Pile Driver (50')	100	Very Loud
Ambulance Siren (100')	90	
Diesel Locomotive (25')	85	Loud
Pneumatic Drill (50')	80	
Freeway (100')	70	Moderately Loud
Vacuum Cleaner (10')	60	
Light Traffic (100')	50	
Large Transformer (200')	40	Quiet
Soft Whisper (5')	0-30	Threshold of Hearing

Source: Peterson & Gross, 1963.

Community noise exposures are typically represented by 24-hour descriptors, such as a 24-hour Leq, Ldn, or CNEL. One-hour and shorter-period descriptors are useful for characterizing noise caused by short-term activities, such as the operation of construction equipment.

Community noise levels are generally perceived as quiet when the L_{dn} is below 45 dBA, moderate in the 45 to 60 dBA range, and loud above 60 dBA. Very noisy urban residential areas can be around 70 dBA L_{dn} or above. Along major thoroughfares, roadside noise levels are typically between 65 and 75 dBA L_{dn}. Any noise intrusions that cause short-term interior levels to rise above 45 dBA at night can disrupt sleep. Eight-hour or longer exposures to noise levels greater than 85 dBA can cause permanent hearing damage.

Vibrating objects in contact with the ground radiate energy through that medium; if a vibrating object is massive enough and/or close enough to the observer, its vibrations are perceptible. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured in vibration decibels (VdB).

The background vibration velocity level in residential areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings such as the operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, and 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

The general human response to different levels of groundborne vibration velocity levels is described in Table 3.9-2.

Table 3.9-2: Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	*Human Reaction*
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Source: Federal Railroad Administration, 1998.

Sensitive Receptors

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to elevated noise levels, such as children, the elderly and people with illnesses. Examples include schools, hospitals and residential areas. Sensitive receptors in Petaluma include approximately 20 elementary schools, two junior high schools, seven high schools, two convalescent homes, and one hospital.

Existing Noise Environment

Major sources of noise in Petaluma include traffic, railroads, and the Petaluma Municipal Airport, as discussed in detail below.

Traffic Noise

The predominant noise source in Petaluma is motor vehicle traffic on U.S. 101, which bisects the city from northwest to southeast. Since the 1987 General Plan Noise Report, Petaluma's population has increased by nearly 50 percent, from 37,300 (1985 estimate) to 54,548 (2000 Census). Most of the new housing development associated with this population growth is located east of U.S. 101. Continued growth and congestion in the U.S. 101 corridor has led to plans to expand U.S. 101 from four to six lanes, which can be expected to increase traffic volume on the freeway. Increased traffic on U.S. 101 and on Petaluma's arterial streets can be expected to increase noise exposure for sensitive receptors along these thoroughfares. Major arterial streets with substantial noise levels include Washington Street, Lakeville Highway, Petaluma Boulevard/Old Redwood Highway, McDowell Boulevard (including southern extension), Adobe Road (along Petaluma's northern boundary), and Sonoma Mountain Parkway/Ely Road corridor. In general, auto traffic volumes will increase by 2025, along with greater noise levels.

Traffic data collected for the General Plan update were used to quantify existing traffic-related noise along Petaluma's roadways. Motor vehicle counts were conducted at 56 locations in Petaluma, and based on these counts, the Average Daily Traffic (ADT) on each roadway segment was estimated. For purposes of this report, only roadway segments over 10,000 ADT were analyzed. Roadway segments with less than 10,000 ADT were not analyzed because the noise contours, as measured from the road centerline, are primarily within the road right-of-way. The traffic data were input into a noise prediction spreadsheet that calculates CNEL at 100 feet from

the centerline of the roadways for each of the segments. From this, distances from the centerline of the roadway to the 70, 65, and 60 CNEL contours were calculated and are shown in Table 3.9-3 and Figure 3.9-1. The 70, 65, and 60 CNEL contours were selected because the City's General Plan uses these to define normally acceptable noise levels for different land uses. In addition, they are consistent with the State Government Code for normally acceptable noise levels.

The noise contours in Figure 3.9-1 indicate that all parcels within approximately one-third mile of U.S. 101 are subject to ambient noise levels greater than 60 dB CNEL. The following roadways generate noise levels greater than 65 dB CNEL:

U.S. 101;
Washington Street;
Lakeville Highway; and
Petaluma Boulevard/Old Redwood Highway.

Table 3.9-3: Existing Roadway Noise Levels

Roadway Segment	*CNEL at 100 Feet*	*Distance to Noise Contour*[1]		
		70 CNEL	*65 CNEL*	*60 CNEL*
U.S. 101 mid Petaluma	75.7	372	1,177	3,720
U.S. 101 north of Petaluma	76.1	410	1,296	4,097
U.S. 101 south of Petaluma	75.3	339	1,071	3,386
Bodega west of Lohrman	62.8	–	60	190
Corona Road east of U.S. 101	62.6	–	57	131
Corona Road west of U.S. 101	61.2	–	–	131
D Street east of Petaluma Boulevard	62.4	–	55	173
Ely Road north of Frates Road	59.0	–	–	79
Frates Road east of Ely Road	58.6	–	–	72
Lakeville Street east of U.S. 101	65.1	–	102	322
Lakeville Street south of Frates Road	64.9	–	97	306
Lakeville Street south of Washington Street	59.0	–	–	79
Lakeville Street west of U.S. 101	63.2	–	66	210
McDowell Blvd north of Lakeville Street	64.1	–	81	257
Old Redwood Highway east of U.S. 101	66.4	44	139	440
Old Redwood Highway west of U.S. 101	65.4	–	108	343
Petaluma Blvd east of Southern Crossing	62.8	–	61	192
Petaluma Blvd south of Payran Street	63.9	–	77	243
Washington Street east of U.S. 101	66.0	–	126	399
Washington Street east of Petaluma Blvd	63.5	–	71	226
Washington Street west of U.S. 101	65.6	–	115	365

Notes: Distances are in feet from roadway centerline. Distances to noise contours do not include adjustments for intervening structures which would reduce the distances. Distances also do not include adjustments for topography.

Table 3.9-3: Existing Roadway Noise Levels

Roadway Segment	CNEL at 100 Feet	Distance to Noise Contour[1]		
		70 CNEL	65 CNEL	60 CNEL

Source: EIP Associates, 2006.

Railroad Noise

Petaluma is traversed by two railroad alignments owned by the Northwestern Pacific Railroad Authority (NWPRA). The main line track carries all through traffic in and out of Petaluma, while the second line, which is not a continuous track, previously provided freight service to businesses along the Petaluma River.[1] . Should light-rail transportation be initiated by SMART noise levels during train pass-bys could be bothersome to residents near the rail line; however, they would be limited to twenty-four occurrences (twelve round trips) or fewer and generally occur during daytime hours (per SMART DEIR).

Petaluma Municipal Airport

The Petaluma Municipal Airport is classified in the National Plan of Integrated Airport Systems (NPIAS) as a reliever airport for the greater San Francisco Bay Area. It is owned and operated by the City of Petaluma and is located in the Petaluma city limits along the eastern UGB. Most of the land north and east of the airport is agricultural or is dedicated parks and open space land. Residential development lies close to the airport on its southwest and northwest side.

Annual operations (takeoffs and landings) at Petaluma Municipal Airport were estimated in 2004 at over 53,000; averaging approximately 145 flights per day. Annual operations include local general aviation operations, which are those that stay in the immediate airport vicinity, and itinerant general aviation operations, which are those with origins or destinations beyond the immediate airport area. Year 2010 forecasts for the airport predict 95,000 operations, 30 percent of which will be itinerant operations, and 70 percent local operations (Sonoma County Airport Land Use Commission, 2001).

Figure 3.9-2 and Table 3.9-4 show CNEL noise contours at the Petaluma Airport based on forecast activity in the year 2010. The shape of the noise contours reflects the dominant use of Runway 29 for both departures and arrivals. The 55 CNEL contour is wider and longer to the northwest and shorter and narrower to the southeast of the airport because of a higher percentage of departures to the northwest from Runway 29. Departure noise is generally louder than arrival noise, thus the spike shape in the southeast. Only ten percent of arrivals and departures occur in the opposite direction on Runway 11; therefore, the dominant flow to the northwest accounts for the overall shape of the contours.

1. Freight service along the NWP corridor was halted in by the Federal Railroad Authority in 2001 (Sonoma-Marin Rail Transit, 2005).

Table 3.9-4: Noise Exposure Area: 2010 Forecast, Petaluma Municipal Airport

CNEL Contour	*Total Area within Contour*
55 dB CNEL	1.08 square miles
60 dB CNEL	0.48 square miles
65 dB CNEL	0.22 square miles
70 dB CNEL	0.09 square miles
75 dB CNEL	0.03 square miles

Source: Sonoma County Airport Land Use Commission, Comprehensive Airport Land Use Plan for Sonoma County, January 2001.

The Petaluma Municipal Airport is located adjacent to single-family housing to the south and west and park and recreation land and the city limits to the north and east. The airport is not located directly adjacent to any sensitive receptors; however, a senior housing facility is located approximately one mile to the southwest on Washington Street and is just within the 55 CNEL contour indicated in Figure 3.9-2. Senior housing is considered a sensitive receptor and is affected by elevated noise levels, but 55-65 CNEL for residential uses, including senior housing, is considered conditionally acceptable. In addition, Old Adobe Elementary School is located on Adobe Road and is less than a mile to the east of the airport. However, the school does not fall within the airport noise contours and is not affected by noise from the airport (see Figure 3.9-2).

The projected increase in airport operations, from 53,000 in 2004 to 95,000 in 2010, can be expected to increase noise levels for those land uses adjacent to the airport to the levels indicated in Figure 3.9-2. It is likely that the increase in air traffic will affect existing residences; however, all new residential developments within the 55 to 65 CNEL contour are subject to an outdoor-to-indoor noise level reduction of at least 25-30 decibels. Aviation easements and fair disclosure agreements are required of new dwellings between 55 and 65 CNEL.

REGULATORY SETTING

State Regulations

California requires each local government entity to adopt and implement a Noise Element as part of its General Plan. The Noise Element must analyze and quantify current and projected noise levels from specified sources and prepare noise contours from these sources to be used as a guide for establishing a pattern of land uses that minimizes the exposure of community residents to excessive noise. The Office of Noise Control at the California Department of Health Services has published guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The Department of Health guidelines indicate that residential land uses and other noise sensitive uses would generally be acceptable without special noise insulation requirements in areas where exterior ambient noise levels do not exceed approximately 60 dBA (L_{dn} or CNEL). Residential uses in areas with L_{dn} between 60 and 65 dBA would generally be acceptable with noise reduction measures or insulation. On the other hand, residential uses should generally be discouraged in areas where noise levels are above 65 dBA L_{dn}.

Figure 3.9-1

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Figure 3.9-2

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County Regulations

A Comprehensive Airport Land Use Plan for Sonoma County was prepared in January 2001. This plan is intended to protect and promote the safety and welfare of residents near the public use airports in Sonoma County, while promoting the continued operation of those airports. Specifically, the plan seeks to protect the public from the adverse effects of aircraft noise. The plan contains airport noise/land use compatibility standards for all public use airports in the county. With the exception of hotels and motels, airport-related noise levels for residential uses are unacceptable above 65 CNEL, and conditionally acceptable between 55 and 65 CNEL. Airport-related noise levels above 60 CNEL are unacceptable for schools, libraries, hospitals and nursing homes, and conditionally acceptable between 55 and 60 CNEL. Allowable CNEL levels increase with the decrease in sensitivity of the land use.

Proposed General Plan

The proposed General Plan would include an updated Noise Element. Petaluma, in its General Plan Noise Guidelines, has established noise exposure criteria defining acceptable noise levels. The City uses the State of California land use compatibility noise guidelines, shown in Figure 3.9-3. For residential and lodging uses, normally acceptable noise levels are permitted up to 60 to 65 dBA (Ldn or CNEL). For office/commercial uses as well as schools, churches, libraries, hospital and nursing homes, the guidelines indicate that noise levels up to 70 dBA (Ldn or CNEL) are considered normally acceptable. Normally acceptable is defined as satisfactory, based on the assumption that buildings are of normal conventional construction, without any noise insulation requirements. Figure 3.9-3 also defines conditionally acceptable, normally unacceptable, and clearly unacceptable noise levels.

City of Petaluma Noise Ordinance

Noise levels in Petaluma are regulated by the City of Petaluma's Noise Ordinance (Petaluma Municipal Code, Section 22-301). The Noise Ordinance sets the maximum ambient noise level and defines allowable increases to this level. The maximum ambient noise level for all land uses is 60 dB, and may be increased in 5 dB increments for each time period (cumulative periods of 15, five, and one minutes or more in one hour). For example, daytime ambient noise level may be 70 dB for 15 minutes or less in an hour, 75 dB for five minutes or less in an hour, or 80 dB for one minute or less in an hour. Allowable nighttime levels are slightly lower. The Noise Ordinance also regulates time of use of potentially offensive noise sources, such as construction activities, tools, and loudspeakers. The Ordinance prohibits such activity before 7:00 a.m. and after 10:00 p.m. on weekdays and before 9:00 a.m. and after 10:00 p.m. on weekends and State, federal, and local holidays.

The Petaluma Noise Ordinance and the General Plan Guidelines do not have identical criteria for defining allowable noise levels. Differences between the Ordinance and the Guidelines are a result of different measures used to define allowable noise levels. The Noise Ordinance specifies noise levels using L_{eq} while the General Plan guidelines specify noise levels using L_{dn} or CNEL.

The Noise Ordinance sets the maximum exterior noise exposure level for all land uses at 60 dBA, which is lower than for most of the land uses in the Guidelines. The Guidelines set the community noise exposure level at 60 dBA as the normally acceptable level only for low density residential uses. The normally acceptable level for all other land uses ranges from 65 dBA to 75

dBA. The Noise Ordinance allows for increases in the 60 dBA allowable noise level only for brief periods of time, and also does not distinguish between certain types of land uses.

IMPACT ANALYSIS

Significance Criteria

Impacts of buildout of the proposed General Plan would be significant if they:

As established by the proposed General Plan, expose persons to or generate noise levels in excess of:

60 CNEL for single family residential, duplexes, and mobile homes;

65 CNEL for multifamily residential, hotels, motels;

70 CNEL for schools, libraries, churches, hospitals, and nursing homes; office buildings, business, commercial, and professional uses; playgrounds and neighborhood parks; or

75 CNEL for golf courses, riding stables, water recreation, and cemeteries; and industrial, manufacturing, utilities, and agricultural uses.

Expose persons to or generate excessive groundborne vibration or groundborne noise levels above 85 VdB;

Permanently increase ambient noise levels four dBA or more beyond acceptable standards for noise-sensitive land uses (i.e. residential, hotels, motels, schools, libraries, churches, hospitals, and nursing homes).

Cause unnecessary, excessive, and annoying noise disturbances as defined in City of Petaluma Zoning Ordinance (i.e. Article 22, Performance Standards; Section 22-301, Noise Regulations); or

Methodology & Assumptions

This analysis uses the proposed General Plan land use compatibility guidelines to assess the noise exposure of land uses in the project vicinity. The proposed General Plan establishes the thresholds for noise impacts listed under the Significance Criteria.

For the purpose of this analysis, groundborne vibration impacts associated with human annoyance would be significant if the proposed project exceeds 85 VdB, which is the vibration level that is considered by the Federal Transit Administration (FTA) to be acceptable only if there are an infrequent number of events per day.

Summary of Impacts

The proposed General Plan would have a less-than-significant effect on exposure of sensitive receptors to excessive groundborne vibration and potentially significant and unavoidable impacts on exposure of sensitive receptors to traffic noise levels.

Fig. 3.9-3

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Impacts and Mitigation Measures

Impact 3.9-1 At buildout, implementation of the proposed General Plan would generate increased local traffic volumes in the Planning Area that would result in a substantial increase to existing exterior noise levels that are currently above the City standards. (Significant)

Locations in the vicinity of new development areas could experience changes in noise levels as a result of an increase in the on-site population and resulting increase in motor vehicle trips. The noise levels were calculated at selected locations along the study-area roadway segments in the Planning Area. Existing traffic noise contour distances and future noise contour distances with implementation of the proposed General Plan are presented in Table 3.9-5. As shown in the table, at a distance of 100 feet, the existing noise levels along the roadway segments are currently in excess of the City standard of 60 dBA CNEL for residential uses. As residents along these roadway segments are currently above the standard, the impact would be determined by the proposed project's contribution to the future noise levels. In addition, the setback of individual residences along these roadway segments may be less than 100 feet noise levels presented in the table; therefore, exterior noise levels may be higher than presented in the table.

Table 3.9-5: Traffic Noise Contours

Roadway Segment	*Existing*[1]				*With Project (2025)*			
		Distance to Noise Contour[2]				*Distance to Noise Contour*[2]		
	CNEL at 100 Feet	*70 CNEL*	*65 CNEL*	*60 CNEL*	*CNEL at 100 Feet*	*70 CNEL*	*65 CNEL*	*60 CNEL*
U.S. 101 mid Petaluma	75.7	372	1,177	3,720	77.4	551	1,742	5,508
U.S. 101 north of Petaluma	76.1	410	1,296	4,097	76.8	474	1,499	4,741
U.S. 101 south of Petaluma	75.3	339	1,071	3,386	76.9	487	1,539	4,867
Bodega west of Lohrman	62.8	--	60	190	65.6	--	114	360
Corona Road east of U.S. 101	62.6	--	57	182	62.5	--	56	177
Corona Road west of U.S. 101	61.2	--	--	131	62.9	--	61	194
D Street east of Petaluma Blvd	62.4	--	55	173	62.6	--	57	181
Ely Road north of Frates Road	59.0	--	--	79	64.0	--	80	252
Frates Road east of Ely Road	58.6	--	--	72	63.4	--	69	220
Lakeville Street east of U.S. 101	65.1	--	102	322	66.8	48	152	481
Lakeville Street south of Frates Road	64.9	--	97	306	66.4	44	138	438
Lakeville Street south of Washington Street	59.0	--	--	79	60.0	--	--	101
Lakeville Street west of U.S. 101	63.2	--	66	210	65.9	--	123	390
McDowell Blvd north of Lakeville Street	64.1	--	81	257	66.7	47	149	472
Old Redwood Hwy east of U.S. 101	66.4	44	139	440	68.5	70	222	703
Old Redwood Hwy west of U.S. 101	65.4	--	108	343	67.2	53	167	528
Petaluma Blvd east of Southern Crossing	62.8	--	61	192	63.2	--	66	208
Petaluma Blvd south of Payran Street	63.9	--	77	243	66.0	--	127	401
Rainer Extension between U.S. 101 and McDowell Blvd[3]	NA	NA	NA	NA	67.6	57	181	573
Rainer Extension between U.S. 101 and Petaluma Blvd[3]	NA	NA	NA	NA	67.1	51	161	509
Washington Street east of U.S. 101	66.0	--	126	399	66.9	49	156	494
Washington Street east of Petaluma Blvd	63.5	--	71	226	65.0	--	101	320
Washington Street west of U.S. 101	65.6	--	115	365	64.9	--	97	306

1. Existing noise levels have been calculated for the selected roadway segments using data collected in 2001 and 2003.
2. Distances are in feet from roadway centerline. Distances to noise contours do not include adjustments for intervening structures which would reduce the distances. Distances also do not include adjustments for topography.
3. Rainer Extension is to be completed within the 20 year planning period.

Source: EIP Associates, 2006.

The noise level increase for sensitive receptors along the selected roadways as a result of the proposed General Plan is presented in Table 3.9-6 and Figure 3.9-4. As shown in the table, the traffic associated with buildout of the proposed General Plan would increase projected local noise levels by more than one decibel in most of the roadway segments. Based on the thresholds

established by the proposed General Plan, the proposed General Plan would result in significant noise impacts at two locations. The most significant increases due to increased traffic volumes would occur along the roadway segment of Ely Road north of Frates Road, with a maximum noise level increase of 5.0 dBA CNEL, and along the roadway segment of Frates Road east of Ely Road, with a maximum noise level increase of 4.8 dBA CNEL. An increase of this magnitude would exceed the proposed General Plan threshold of significance of 4 dBA.

Table 3.9-6: Traffic Noise Levels at Sensitive Receptors

		dBA CNEL at 100 feet				
Roadway Segment	*Sensitive Receptor*	*Existing (2001)*	*With Project (2025)*	*Total Increase*	*Significance Threshold*[1]	*Significant Impact?*
Bodega west of Lohrman	Residential	62.8	65.6	2.8	4.0	No
Ely Road north of Frates Road	Residential	59.0	64.0	5.0	4.0	Yes
Frates Road east of Ely Road	Golf Course/ Residential	58.6	63.4	4.8	4.0	Yes
Lakeville Street east of US 101	Mobile Homes	65.1	66.8	1.7	4.0	No
Lakeville Street south of Frates Road	Residential	64.9	66.4	1.5	4.0	No
McDowell Blvd north of Lakeville Street	Residential	64.1	66.7	2.6	4.0	No
Old Redwood Hwy east of U.S. 101	Hotel	66.4	68.5	2.1	4.0	No
Petaluma Blvd east of Southern Crossing	Residential	62.8	63.2	0.4	4.0	No
Washington Street east of U.S. 101	Hotel	66.0	66.9	0.9	4.0	No
Washington Street east of Petaluma Blvd	Mixed Use/ Residential	63.5	65.0	1.5	4.0	No

1. Based on proposed General Plan Policy 10-P-12. Analysis based on noise exposure at 100 feet. Actual noise exposure levels may vary based on individual setbacks.

Source: EIP Associates, 2006.

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Figure 3.9-4: Future Roadway Noise

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Proposed General Plan Policies that Reduce the Impact

The following proposed policies would reduce exterior noise levels:

10-P-6 Continue efforts to incorporate noise considerations into land use planning decisions, and guide the location and design of transportation facilities to minimize the effects of noise on adjacent land uses.

10-P-7 Discourage location of new noise-sensitive uses, primarily homes, in areas with projected noise levels greater than 65 dB CNEL. Where such uses are permitted, require incorporation of mitigation measures to ensure that interior noise levels do not exceed 45 dB CNEL.

10-P-9 Continue to require control of noise or mitigation measures for any noise-emitting construction equipment or activity.

The City's Noise Ordinance establishes controls on construction-related noise.

10-P-10 As part of development review, use [General Plan] Figure 10-2: Land Use Compatibility Standards to determine acceptable uses and installation requirements in noise-impacted areas.

10-P-11 Discourage the use of sound walls anywhere except along U.S. 101 and/or along the NWPRA corridor, without findings that such walls will not be detrimental to community character. When sound walls are deemed necessary integrate them into the streetscape.

10-P-12 In making a determination of impact under the California Environmental Quality Act (CEQA), consider an increase of four or more dBA to be "significant" if the resulting noise level would exceed that described as normally acceptable for the affected land use in General Plan Figure 10-3: Land Use Compatibility for Community Noise Environments.

These General Plan policies would reduce impacts from increased traffic noise levels within the City, but would not reduce noise levels below the General Plan significance thresholds at the locations listed in Table 3.9-6. While sound walls are discouraged by proposed Policy 10-P-11, installation of sound walls at these locations may be necessary to reduce noise impacts on sensitive receptors.

As the Planning Area would not be expected to be developed to the maximum level, the projected increase in the table may be greater than would be expected with the proposed General Plan. However, as no feasible mitigation exists to reduce roadway noise levels along the affected roadways to a less-than-significant level, this impact is considered to be significant and unavoidable.

Impact 3.9-2 Implementation of the proposed General Plan would add new stationary sources of noise, but would not exceed the City noise standards. (Less than significant)

Implementation of the proposed General Plan would increase residential, commercial, and industrial development within the City. The proposed General Plan would result in a net increase of up to approximately 6.1 million square feet of new non-residential uses and up to 6,000 new residential units within the Planning Area. However, as the future development and the specific

mix of uses will be dependent upon market conditions, the actual buildout within the Planning Area could be much less than that allowed under the proposed General Plan.

New stationary sources of noise associated with the future commercial, office, and hotel uses, such as rooftop heating, ventilation, and air conditioning (HVAC) equipment, would be installed within the Planning Area under the proposed General Plan. Existing sensitive receptors that are located adjacent to these commercial uses would be exposed to increased noise levels resulting from operation of the new HVAC equipment as well as from future loading/unloading operations associated with the new commercial developments. Large HVAC systems can result in noise levels that average between 50 and 65 dBA L_{eq} at 50 feet from the equipment. The HVAC units would likely be mounted on the rooftops of new buildings and would be screened from view by building features. Since the actual noise levels from specific HVAC equipment may vary at each development site within the Planning Area, depending on building design features, noise impacts related to operation of HVAC equipment will need to be further evaluated on a project-specific basis. However, all new development within the City would be required to adhere to the City's established noise standards for different types of uses. The proposed General Plan includes Policy 10.2-P-2, which would require placement of fixed equipment inside walls or on roof tops to reduce noise impacts. All new commercial development within the Planning Area would be required to be designed in a manner such that they would be in accordance with the compatibility guidelines set forth in the City's General Plan. To meet the City standards, shielding of the HVAC equipment and the installation of appropriate noise muffling devices may be required to reduce noise levels that may affect nearby noise-sensitive uses. Therefore, the resulting noise levels from stationary sources would not exceed the allowable City standards, and this impact would be less than significant.

Proposed General Plan Policies that Reduce the Impact

In addition to Policies 10-P-7 and 10-P-12 listed under Impact 3.9-1, the following proposed policy would reduce noise from stationary sources:

10-P-8: Ensure that the City's Noise Ordinance and other regulations:

> Require that applicants for new noise-sensitive development in areas subject to noise levels greater than 65 dB CNEL obtain the services of a professional acoustical engineer to provide a technical analysis and design of mitigation measures.
>
> Require placement of fixed equipment, such as air conditioning units and condensers, inside or in the walls of new buildings or on roof-tops of central units in order to reduce noise impacts on any nearby sensitive receptors.
>
> Establish appropriate noise-emission standards to be used in connection with the purchase, use, and maintenance of City vehicles.

Mitigation Measures

No further mitigation is required.

Impact 3.9-3 Construction activities associated with implementation of the proposed General Plan would generate and expose persons nearby to excessive groundborne vibration or groundborne noise levels. (Less than significant)

Construction activities that would occur under the proposed General Plan would have the potential to generate low levels of groundborne vibration. Table 3.9-7 identifies various vibration velocity levels for the types of construction equipment that would operate within the Planning Area during construction.

As the amount of future development and mix of uses in the Planning Area would be subject to market demands over the 20-year planning period, construction activities may occur sporadically throughout the Planning Area. Construction activities would primarily impact existing buildings, including homes, located adjacent to construction sites within the Planning Area. These buildings could sometimes be as close as 25 feet to the construction site or as far as several hundred feet away. Based on the information presented in Table 3.9-7, vibration levels could reach up to 87 VdB at the buildings located within 25 feet of construction. For sensitive uses that are located at or within 25 feet of potential project construction sites, sensitive receptors (e.g., residents and school children) at these locations may experience vibration levels during construction activities that exceed the FTA's vibration impact threshold of 85 VdB for human annoyance. If construction occurs more than 50 feet from sensitive receptors, the impact associated with groundborne vibration generated by the equipment would be below 85 VdB and thus would be less than significant. However, as specific site plans or constructions schedules are unknown at this time, it may be possible that construction activities could occur as close as 25 feet from sensitive receptors. This would result in these sensitive receptors experiencing vibration impacts above the threshold of 85 VdB, in which case this impact would be potentially significant. The Petaluma Zoning Ordinance Section 22-301, Noise Regulations, limits construction to the hours of 7:00 a.m. to 10:00 p.m. on weekdays and between 9:00 a.m. and 10:00 p.m. on Saturdays, Sundays, and holidays. Future construction activities associated with the proposed General Plan would be limited to these hours to minimize exposure of persons to construction noise during the sensitive hours of the day. As the hours of construction would be limited, the impact from groundborne vibration and groundborne noise would be considered less than significant.

Table 3.9-7: Vibration Source Levels for Construction Equipment

	Approximate VdB			
Equipment	*25 Feet*	*50 Feet*	*75 Feet*	*100 Feet*
Large Bulldozer	87	81	77	75
Loaded Trucks	86	80	76	74
Jackhammer	79	73	69	67
Small Bulldozer	58	52	48	46

Source: Federal Railroad Administration, 1998; and EIP Associates, 2002.

In addition to the construction equipment shown in Table 3.9-7, vibration that would be experienced from the use of impact pile-drivers could reach as high as 112 VdB at a distance of 25 feet. While the use of impact pile-drivers would not be anticipated to occur often with the type of construction associated with the proposed General Plan, there is the potential that such equipment may be used on rare occasions for construction. With vibration levels as high as 112 VdB at a distance of 25 feet, it has been determined that sensitive uses would need to be

located at least 560 feet away from this vibration source in order to experience vibration levels below 85 VdB.[2]

The City of Petaluma Zoning Ordinance Section 22-302, Vibration, prohibits vibrations in excess of approximately 80 VdB (0.002g at 50 cps) and single impulse periodic vibrations with an average interval greater than 5 minutes of approximately 87 VdB (0.01g at 50 cps). Therefore, because vibration would be regulated by the City's Zoning Ordinance, the potential for impacts from vibration would be considered less than significant.

Proposed General Plan Policies that Reduce the Impact

Policy 10-P-9, listed under Impact 3.9-1, would reduce construction noise impacts related to groundborne vibration.

Mitigation Measures

No further mitigation is required,

Impact 3.9-4 Construction activities associated with implementation of the proposed General Plan could generate noise levels that exceed the City standards. (Less than significant)

Implementation of the proposed General Plan would increase residential, commercial, and industrial development within the City. The proposed General Plan would result in a buildout population of 72,707, an increase of approximately 15,600 residents (above the 2005 population). An additional 6,000 residential units and approximately 6.1 million square feet of non-residential uses could occur under the proposed plan, compared to existing conditions. This represents the maximum development potential over a 20-year planning period in the Planning Area. Although buildout under the proposed General Plan is expected to occur incrementally over time, the future development and the specific mix of uses will be dependent upon market conditions. Thus, the actual buildout within the Planning Area could be much less than that allowed under the proposed General Plan.

The EPA has compiled data regarding the noise generating characteristics of specific types of construction equipment and typical outdoor construction activities. These data are presented in Tables 3.9-8 and 3.9-9. The noise levels from the construction equipment and activities would diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 86 dBA measured at 50 feet from the noise source to the receptor would reduce to 80 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 74 dBA at 200 feet from the source to the receptor.

Under the proposed General Plan, construction for new developments could occur near sensitive receptors and would have the potential to result in noise levels above the standards established in the General Plan. Based on the noise levels presented for typical construction equipment and mixes of construction equipment, construction activities under the proposed General Plan would

2. The distance of 560 feet is determined from the following equation from Harris Miller Miller & Hanson Inc.'s (HMMH) *Transit Noise and Vibration Impact Assessment, Final Report*: **Lv(D)=Lv(25 ft) – 20log(D/25)**, where Lv = vibration level of equipment, D = distance from the equipment to the receiver, Lv(25 ft) = vibration level of equipment at 25 feet.

have the potential to result in noise levels above the 60 dBA standard for single family residential; the 65 dBA standard for multifamily residential and transient lodging; and the 70 dBA standard for schools, churches, and hospitals.

Table 3.9-8: Noise Ranges of Typical Construction Equipment

Equipment	*Noise Levels in dBA L_{eq} at 50 Feet*[1]
Front Loader	73 to 86
Trucks	82 to 95
Cranes (moveable)	75 to 88
Cranes (derrick)	86 to 89
Vibrator	68 to 82
Saws	72 to 82
Pneumatic Impact Equipment	83 to 88
Jackhammers	81 to 98
Pumps	68 to 72
Generators	71 to 83
Compressors	75 to 87
Concrete Mixers	75 to 88
Concrete Pumps	81 to 85
Back Hoe	73 to 95
Pile Driving (peaks)	95 to 107
Tractor	77 to 98
Scraper/Grader	80 to 93
Paver	85 to 88

1. Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.

Source: U.S. EPA, 1971

Table 3.9-9: Typical Outdoor Construction Noise Levels

Construction Phase	*Noise Level at 50 Feet with Mufflers (dBA L_{eq})*	*Noise Level at 60 Feet with Mufflers (dBA L_{eq})*	*Noise Level at 100 Feet with Mufflers (dBA L_{eq})*
Ground Clearing	82	80	76
Excavation/Grading	86	84	80
Foundations	77	75	71
Structural	83	81	77
External Finishing	86	84	80

Source: U.S. EPA 1971

Construction activities in the city would be required to comply with Article 22 of the Petaluma Zoning Ordinance, which restricts the hours of operation to 7:00 a.m. to 10:00 p.m. Monday through Friday and 9:00 a.m. to 10:00 p.m. on Saturdays, Sundays, and holidays. As future construction activities associated with the proposed General Plan would be limited to these hours, this impact would be considered less than significant.

Although impacts from construction activity are expected to be less than significant due to compliance with the Zoning Ordinance, implementation of Mitigation Measure 3.9(a) would ensure that impacts associated with construction-related noise would remain less than significant by requiring project developers to implement best management practices (BMPs) to reduce construction noise levels. These BMPs include placing noise-generating construction equipment and locating construction staging areas away from residences, where feasible, and the scheduling of high noise-producing activities between the hours of 8 a.m. and 5 p.m. to minimize disruption on sensitive uses.

Proposed General Plan Policies that Reduce the Impact

Policy 10-P-9, listed under Impact 3.9-1, would reduce construction-related noise impacts.

Mitigation Measures

Although not required to avoid a significant impact, the following mitigation measure would further reduce noise levels.

3.9(a) Project developers shall require by contract specifications that the following construction best management practices (BMPs) be implemented by contractors to reduce construction noise levels:

> Two weeks prior to the commencement of construction, notification must be provided to surrounding land uses disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period;
>
> Ensure that construction equipment is properly muffled according to industry standards;
>
> Place noise-generating construction equipment and locate construction staging areas away from residences, where feasible;
>
> Schedule high noise-producing activities between the hours of 8 a.m. and 5 p.m. to minimize disruption on sensitive uses; and
>
> Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, noise barriers or noise blankets.

3.10 AIR QUALITY

This section discusses the climate in the project area; federal, State, and regional air quality standards created to protect public health from unsafe air pollution levels; and existing and future air quality conditions in Petaluma and the San Francisco Bay Area for both "criteria air pollutants" and "toxic air contaminants," as defined below.

ENVIRONMENTAL SETTING

Physical Setting

Petaluma has a Mediterranean climate with cool wet winters and hot dry summers. The Petaluma Valley is bordered to the east by the Sonoma Mountains. To the west is a series of low hills, followed by the Estero Lowlands, which open to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay in the east is known as the Petaluma Gap. Winds move eastward through the Petaluma Gap, along the trough occupied by the Bodega Bay Highway. During winter storms, winds shift about 180 degrees, and come from the south-southeast. The Petaluma Municipal Airport reports light prevailing winds from the west-northwest about 90 percent of the time, where the average measured wind speed is seven miles per hour (City of Petaluma, 1990; City of Petaluma, 2002).

Generally, air pollution potential is low in the Petaluma Valley because of its link to the Petaluma Gap and its low population density. However, there are two scenarios that can produce elevated pollutant levels: 1) stagnant conditions in the morning hours created when a weak ocean breeze meets a weak bay breeze, and 2) an eastern or southeastern offshore wind pattern in the afternoon brings in polluted air from the Central Valley and the Carquinez Strait region. Pollutants from Highway 101 are also carried by these winds into Downtown Petaluma. Localized air pollution can also occur from heavy industrial activities in the southwest subarea of the City.

The State of California is divided into 14 geographic air basins for the purpose of monitoring and controlling regional air quality. The City of Petaluma is located within the Bay Area Air Basin. This area includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Napa, portions of southwestern Solano, and southern Sonoma counties. The air quality within the Bay Area Air Basin is influenced by a wide range of emissions sources - such as dense population centers, heavy vehicular traffic, and industry.

Regional Air Quality

Emissions within the Bay Area are generated by a wide variety of sources including fireplaces, woodstoves, space and water heaters, landscape maintenance equipment, consumer products, industrial processes, and mobile sources - primarily automobile and truck traffic. With the assistance of the BAAQMD, the California ARB compiles inventories and projections of CO, ROG, NO2, SO2, and PM_{10} emissions for the Bay Area. Air quality is monitored at 24 sites within the San Francisco Bay Area Air Basin. ROG is included in the inventories because it is a precursor to ozone formation. Table 3.10-1 presents a summary of the emissions inventory and trends of air pollutants for the Bay Area and Sonoma County. The Bay Area is considered in "attainment" for all of the national standards, with the exception of ozone throughout the Basin. Estimates of substantial reductions in CO emissions projected from 1996 to 2010 are primarily based on projections of motor vehicle emissions reducing over time as older vehicles are retired. PM_{10} is

forecast to increase, mostly due to the growth in motor vehicle travel in the Bay Area. SO2 is also forecast to increase due to growth in stationary source activities. The emissions projections assume the following:

Population, housing, economic growth, and land use will increase as regionally forecast (BAAQMD, 1997).

The State's vehicle fleet will become cleaner, as new vehicles meet California regulations and older vehicles are retired.

The "Smog Check" program will continue.

Controls on industry and business will continue.

Current transportation control measures of regional planning efforts will continue.

Table 3.10-1: Criteria Pollutant Emissions Inventory and Projections (Tons/Day – Annual Average)

	CO	*ROG**	*NOx*	*SOx*	*PM_{10}*
Bay Area					
2000 Estimated					
Total Emissions	2873	535	558	92	169
On-Road Motor Vehicle Emissions	2150	255	274	5	8
(Motor Vehicles' Percent of Total)	(75%)	(48%)	(49%)	(5%)	(5%)
2010 Forecasted					
Total Emissions	1727	396	443	84	203
On-Road Motor Vehicle Emissions	1125	123	198	1	10
(Motor Vehicles' Percent of Total)	(65%)	(31%)	(45%)	(1%)	(5%)
Sonoma County					
2000 Estimated					
Total Emissions	302	47	40	2	19
On-Road Motor Vehicle Emissions	221	25	25	.40	.72
(Motor Vehicles' Percent of Total)	(73%)	(53%)	(63%)	(20%)	(3%)
2010 Forecasted					
Total Emissions	171	32	29	2	21
On-Road Motor Vehicle Emissions	106	12	17	.07	.8
(Motor Vehicles' Percent of Total)	(62%)	(4%)	(59%)	(3.5%)	(4%)

Notes:

* Reactive organic gases (excluding emissions from natural vegetation).
On-Road Motor Vehicle Emissions category in this table does not include paved road dust generated by traffic.

Source: California Air Resources Board, Emissions by Category. Available at: www.arb.ca.gov/emisinv/eib.htm.

Local Air Quality

In general, Petaluma experiences good air quality. Point sources of pollution in Petaluma include gas stations, dry cleaners, quarrying activities, and industrial manufacturing operations; however, emissions from these types of operations do not typically present significant threats to air quality. Point sources, as opposed to mobile sources, are specific points of origin where pollutants are emitted into the atmosphere. Mobile sources, including trains, ships, planes, and on- and off-road vehicles, present the greatest threat to air quality in Petaluma, as well as the region. U.S. 101 and its interchanges are the most significant cause of elevated ozone levels in the area. Wood burning and other outdoor burning during late fall and winter is another source of air pollutants (primarily particulates and carbon monoxide). However, the prevailing wind assists in providing Petaluma with good air quality because there are no significant pollution sources upwind of Petaluma, and pollutant loads tend to be carried to the southeast away from the most developed areas (City of Petaluma, 1990). While air pollution potential is low, Petaluma's role in the cumulative regional air quality must be addressed.

The BAAQMD operates an air quality monitoring station in downtown Santa Rosa at 5th Street, approximately 15 miles north of Petaluma. Table 3.10-2 summarizes recent results from the downtown Santa Rosa air monitoring station for ozone, carbon monoxide and particulate matter. Table 3.10-4 indicates no violations of the federal 8-hour standard for ozone or the federal or State standards for carbon monoxide have occurred in the past five years in Petaluma, and one violation for the State one-hour standard for ozone. Violations of particulate matter standards are a result of combustion, construction, grading, demolition, agricultural activities, and motor vehicles; however, the number of days when violations occurred is significantly lower than previous years, especially the 1980s. Motor vehicles constitute the single largest source of PM_{10} in the Bay Area. Particulates are produced through direct tailpipe emissions of nitrogen oxides and disturbing road dust. PM_{10} is also produced from brake pad and tire wear.

Table 3.10-2: Existing Air Quality in Sonoma County

Air Pollutant	*Standard*	*Number of Days in Which Standard Levels Were Exceeded*				
		2000	*2001*	*2002*	*2003*	*2004*
Ozone						
California Standard	0.09 ppm during 1 hour	0	0	0	1	0
Federal Standard	0.08 ppm during 8 hours	0	0	0	0	0
Carbon Monoxide						
California Standard	9.00 ppm during 8 hours	0	0	0	0	0
Federal Standard	9.00 ppm during 8 hours	0	0	0	0	0
Particulate Matter						
California Standard	50 µg/m3 (daily)	0	2	2	0	NA[1]
Federal Standard	150 µg/m3 (daily)	0	0	0	0	0

1. Data not available

Source: California Air Resources Board website, California Air Quality Data page: http://www.arb.ca.gov/aqd/aqd.htm

Sensitive Receptors

The BAAQMD defines sensitive receptors as "Facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses. Examples include schools, hospitals and residential areas." (BAAQMD, 1997). Sensitive receptors in Petaluma include approximately 20 elementary schools, two junior high schools, seven high schools, one hospital, and several convalescent homes.

REGULATORY SETTING

Federal, State, and local laws and regulations are the basis for controlling air pollution. The major control efforts tend to focus on the six "criteria" air pollutants and the precursor compounds that react to form those pollutants. Criteria air pollutants are a group of pollutants for which regulatory agencies have adopted federal, State, or regional ambient air quality standards and pollution reduction plans. They include ozone, carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter, and lead. Ozone is a secondary pollutant which is formed in the upper atmosphere by chemical reactions between oxides of nitrogen (NOx) and reactive organic gases (ROG) in the presence of sunlight. Motor vehicles are the single largest source of NOx and ROG in the Bay Area.

In addition to criteria air pollutants, toxic air contaminants (TACs), another group of pollutants, has received increasing scrutiny in recent years. TACs refer to a category of air pollutants that pose a potentially chronic or acute hazard to human health when emitted in much smaller quantities than criteria pollutants. Many TACs are confirmed or suspected carcinogens and can be toxic at very low concentrations.

The Federal Clean Air Act, as amended, and the California Clean Air Act are the primary drivers for attaining and maintaining ambient air standards (see below). These laws also provide the basis for the implementing agencies, such as regional air quality districts, to develop mobile and stationary source control measures.

Ambient Air Quality Standards & Attainment Status

Based on the authority of the Federal Clean Air Act, as amended, and the California Clean Air Act, federal and State regulatory agencies set upper limits on airborne concentrations of ozone, CO, NO2, SO2, particulate matter, and lead. Particulate matter is regulated as inhalable particulate matter less than ten microns in diameter (PM_{10}) and fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$).

The federal and State standards for these pollutants are summarized in Table 3.10-3. Such upper limits or "ambient air quality standards" are designed to protect all segments of the population including those most susceptible to the pollutants' adverse effects (e.g., the very young, the elderly, people weak from illness or disease, or persons doing heavy work or exercise). The potential human health effects of these air pollutants are presented in Table 3.10-4.

Most of the Bay Area is in attainment for all air quality standards, except State and federal standards for ozone and the State standard for PM_{10}. The State standard for ozone is violated roughly 10 to 35 times per year throughout the region, and the PM_{10} standard has been exceeded on up to 30 percent of the monitoring days. Air quality projections for the Bay Area indicate that

ozone and carbon monoxide levels will be reduced, but PM_{10} and $PM_{2.5}$ emissions are expected to increase. This is a result of motor vehicles (direct tailpipe emissions of particulates, brake pad and tire wear, and physical resuspension of road dust), construction activities, and woodburning stoves.

Table 3.10-3: Federal and State Air Quality Standards

	Averaging Time	*California Standard*[a]	*Federal Standard*[b]
Ozone	1-hour	0.09 ppm	0.12 ppm
	8-hour	0.070 ppm	0.08 ppm
Carbon Monoxide (CO)	1-hour	20.00 ppm	35.00 ppm
	8-hour	9.00 ppm	9.00 ppm
Nitrogen Dioxide (NO2)	1-hour	0.25 ppm	--
	Annual Average	--	0.053 ppm
Sulfur Dioxide (SO2)	1-hour	0.25 ppm	--
	3-hour	--	0.5 ppm
	24-hour	0.04 ppm	0.14 ppm
	Annual Average	--	0.03 ppm
Particulate Matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3
	Annual Geometric Mean	30 µg/m^3	--
	Annual Arithmetic Mean		50 µg/m^3
		20 µg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	65 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3
Lead (Pb)	30-day Average	1.5 µg/m^3	--
	Calendar Quarter	--	1.5 µg/m^3

ppm = parts per million by volume
µg/m3 = micrograms per cubic meter
-- = No standard exists for this category

a. California standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter (PM_{10}) are values that are not to be exceeded.

b. The form of the federal standards (i.e., how the standard is applied) varies from pollutant to pollutant. For further information 40, CFR Part 50 includes the relevant form for each federal standard.

Source: EIP Associates

Table 3.10-4: Health Effects Summary of the Major Criteria Air Pollutants

Air Pollutant	*Adverse Effects*
Ozone	Eye irritation. Respiratory function impairment.
Carbon Monoxide	Impairment of oxygen transport in the bloodstream. Aggravation of cardiovascular disease. Impairment of central nervous system function. Fatigue, headache, confusion and dizziness. Can be fatal in the case of very high concentrations in enclosed places.
Nitrogen Dioxide	Risk of acute and chronic respiratory illness.
Sulfur Dioxide	Aggravation of chronic obstruction lung disease. Increased risk of acute and chronic respiratory illness.
Particulate Matter (PM_{10})	Increased risk of chronic respiratory illness with long exposure. Altered lung function in children. With SO2, may produce acute illness.
Fine Particulate Matter ($PM_{2.5}$)	May be inhaled and possibly lodge in and/or irritate the lungs.
Lead	Prolonged exposure may cause anemia, kidney disease, and in severe cases, neuromuscular disorder and neurologic dysfunction.

Source: Bay Area Air Quality Management District Air Quality Handbook, 1993; Zannetti, Paolo, Air Pollution Modeling, 1990.

Air Quality Management Plans

Air quality planning in the Petaluma region is governed at federal, State, regional, and local levels. At the federal level, the Environmental Protection Agency (EPA) regulates air quality under the Clean Air Act. Through the authority granted by this Act, EPA regulations and programs are designed to require states to attain and maintain compliance with federal standards. The EPA also has programs that identify and regulate TACs. If states are not in compliance with federal standards, they are required to prepare and submit air quality plans to show how the standards will be met.

On the State level, the California Air Resources Board (ARB) coordinates and oversees both State and federal air quality control programs. The primary responsibility of the ARB is the development of the State Implementation Plan (SIP). The SIP is the State's overall air quality control strategy for both mobile and stationary sources. Control programs for these sources are carried out at the regional or county level.

On the regional and local levels, the Bay Area Air Quality Management District (BAAQMD) is primarily responsible for planning, implementing, and enforcing the federal and State ambient standards in the Bay Area. In coordination with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG), the BAAQMD prepares the Bay Area Clean Air Plan on a triennial basis. The most recent plan for the State ozone standard was the 2000 Clean Air Plan. On January 4, 2006, the BAAQMD adopted the Bay Area 2005 Ozone Strategy to address the planning requirements for the State one-hour ozone standard. This plan includes a comprehensive strategy to reduce ozone emissions from stationary, area, and mobile

sources. A main objective is to indicate how the region will attain the State ozone standards, as mandated by the Clean Air Act. The primary objective of the Ozone Strategy is to reduce ozone precursor pollutants through the implementation of all feasible control measures. The Ozone Strategy must indicate how the BAAQMD will attain the State ozone standard by the earliest practicable date, including (1) additional control measures for existing stationary sources, (2) a permitting program that will result in no net increase in emissions from new stationary sources, (3) provisions for indirect source controls, and (4) transportation control measures.

IMPACT ANALYSIS

Significance Criteria

Impacts of buildout of the proposed General Plan would be significant if they:

Conflict with or obstruct implementation of the applicable air quality plan;

Violate any air quality standard or threshold or contribute to an existing or projected air quality violation;

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

Expose sensitive receptors to substantial pollutant concentrations; or

Create objectionable odors affecting a substantial number of people.

Methodology & Assumptions

The BAAQMD has established specific thresholds and methodologies for evaluating air quality impacts from implementation of plans. Local plans (such as city general plans) must show consistency with regional air quality plans and policies in order to claim a less-than-significant impact on air quality. In order to complete the evaluation, the proposed General Plan needs to be compared to the most recently adopted attainment plan (Bay Area 2005 Ozone Strategy as of January 4, 2006). According to the BAAQMD CEQA Guidelines, implementation of the proposed General Plan would be inconsistent with the Ozone Strategy if:

Population growth for the City of Petaluma exceeds the values included in the current attainment plan the 2005 Ozone Strategy (basis: ABAG Projections 2003);

The rate of increase in vehicle miles traveled for the City of Petaluma exceeds the rate of increase in population;

Reasonable efforts are not made to implement the transportation control measures (TCMs) of the attainment plan; and

Buffer zones are not included to avoid odor and toxic impacts.

During buildout of the proposed General Plan, heavy equipment used for the construction activities would cause emissions of diesel exhaust and generate emissions of dust. Emissions caused during construction phases are analyzed according to the BAAQMD guidelines with recommendations for implementation of control measures.

To characterize conditions after buildout of the General Plan, the population growth, transportation demand, and energy use of the planning area are compared to the current attainment plan for consistency. Consistency of local plans with regional air quality plans ensures that emissions related to local activity would be within the projections used for determining regional attainment of the ambient air quality standards. The regional air quality plan consistency analysis includes mobile sources as well as stationary and area sources. Localized air quality impacts depend upon project-specific vehicle activity at intersections also provided by the transportation analysis for this EIR. Heavily congested intersections are examined for the potential to cause localized CO violations.

Summary of Impacts

The proposed General Plan buildout projections would be inconsistent with the Bay Area's 2005 Ozone Strategy, which would result in a significant and unavoidable impact. The proposed project would have a less than significant effect on exposure of sensitive receptors to pollutants and odors and would not contribute substantially to an existing air quality violation.

Impacts and Mitigation Measures

Impact 3.10-1: Buildout of the proposed General Plan would result in population levels that could conflict with the Bay Area 2005 Ozone Strategy. (Significant)

The Bay Area 2005 Ozone Strategy includes the latest triennial update to the attainment plan. The 2005 Ozone Strategy was prepared to accommodate growth, to reduce the high levels of ozone and ozone precursors within the areas under the jurisdiction of the BAAQMD, to return clean air to the region, and to minimize the impact on the economy. Projects that are considered to be consistent with the 2005 Ozone Strategy would not interfere with attainment because this growth is included in the projections used in the formulation of the 2005 Ozone Strategy. Therefore, projects, uses, and activities that are consistent with the applicable assumptions used in the development of the 2005 Ozone Strategy would not jeopardize attainment of the air quality levels identified in the 2005 Ozone Strategy, even if they exceed the BAAQMD's recommended daily emissions thresholds. According to BAAQMD CEQA Guidelines, the proposed General Plan must satisfy an analysis of consistency with the attainment plan based on 1) a comparison of plan-related population growth, and 2) a review of travel growth and transportation control with the projections and policies used in the most recently adopted attainment plan.

Population. The 2005 Ozone Strategy was based on the 2003 ABAG projections. General Plans that are consistent with the projections of employment and population forecasts identified by ABAG are considered consistent with the growth projections of the adopted air quality plan.

Implementation of the proposed General Plan would indirectly induce population growth through increased residential development and would result in a slight increase in future population compared to the future population that would be expected under the existing General Plan. The proposed General Plan anticipates a population of approximately 72,700 in the year 2025, while buildout of the existing General Plan would result in approximately 69,100 in the year 2025. As the anticipated populations are based on buildout of the respective plans, actual development may be less than analyzed due to varying market conditions.

ABAG's prediction for future population growth in Petaluma by the year 2025 is approximately 64,200. The future population growth for buildout of the proposed General Plan would be greater than predicted in ABAG's Projections 2003 by approximately 8,500 residents. Therefore, the proposed plan would have the potential to induce population growth above the levels identified in the 2005 Ozone Strategy. However, population growth based on buildout of the existing General Plan would also exceed ABAG's 2025 predictions for Petaluma.

The City of Petaluma's Growth Management Plan restricts the number of new residential building permits to 500 per year. The 6,000 residential units that are included in buildout of the proposed General Plan could be within the 500 unit per year limit, depending on phasing and market demand. Therefore, this growth management plan would not restrict full buildout of the proposed General Plan, and population growth would still have the potential to exceed the ABAG projections. As population growth under the proposed General Plan would be greater than the ABAG projections that were used in the 2005 Ozone Strategy for air quality planning, the BAAQMD assumes that emissions related to human activity in Petaluma would likely be greater than projected in the 2005 Ozone Strategy. Consequently, attainment of the State one-hour ozone standard would potentially be delayed. Because the General Plan's estimated population is greater than population assumed in the 2005 Ozone Strategy, the proposed General Plan would be deemed inconsistent with the 2005 Ozone Strategy. This is considered a significant impact under CEQA. In fact, the total population is only one factor in determining whether emissions would actually increase beyond projected levels in the 2005 Ozone Strategy Plan. As noted above, even existing General Plan buildout populations would exceed the population projected in the 2005 Ozone Strategy for Petaluma. Furthermore, the Ozone Strategy guidelines do not factor in the proposed General Plan's air quality benefits, including transit-oriented development and transportation demand management measures.

Travel Growth and Transportation Control. Compared to travel demand that would be expected to occur with new development under the existing General Plan, implementation of the proposed General Plan would reduce new motor vehicle travel by incorporating policies to minimize creation of new project-related trips. Implementation of the proposed General Plan would incorporate land use policies promoting pedestrian-scaled design and circulation policies to promote use of alternative transportation such as bicycling, bus transit, and carpooling. Each of these features would reduce vehicular emissions by reducing the number of new vehicle trips or reducing the length of trips. Under the proposed General Plan, per capita vehicle miles traveled (VMT) would not increase.

In order to determine consistency of the proposed General Plan Update with the Bay Area 2005 Ozone Strategy, this analysis assesses whether transportation control measures (TCMs) of the Ozone Strategy are being implemented. The City of Petaluma has jurisdiction to operate as an implementing agency for some of the TCMs. The policies of the proposed General Plan partially or entirely implement some of the TCMs of the 2005 Ozone Strategy. The proposed General Plan would also include TCMs that are consistent with the control measures from the 2005 Ozone Strategy.

While the proposed General Plan would be consistent with the TCM strategies included in the 2005 Ozone Strategy, it would not be consistent with the growth projections. As described above, inconsistency with the population projections would be a significant and unavoidable impact.

Proposed General Plan Policies that Reduce the Impact

The following policies from the proposed General Plan would reduce potential air pollution emissions:

4-P-8 Reduce motor vehicle related air pollution.

A. Enforce land use and transportation strategies described in Chapter 2: Land Use and Chapter 5: Mobility that promote use of alternatives to the automobile for transportation, including walking, bicycling, bus transit, and carpooling.

4-P-11 Improve air quality by reducing emissions from stationary point sources of air pollution (e.g. equipment at commercial and industrial facilities) and stationary area sources (e.g. wood-burning fireplaces & gas powered lawnmowers) which cumulatively emit large quantities of emissions.

A. Work with the Bay Area Air Quality Management District to achieve emissions reductions for non attainment pollutants; including carbon monoxide, ozone, and PM-10, by implementation of air pollution control measures as required by State and federal statutes.

B. The BAAQMD's CEQA Guidelines should be used as the foundation for the City's review of air quality impacts under CEQA.

C. Use Petaluma's development review process and the California Environmental Quality Act (CEQA) regulations to evaluate and mitigate the local and cumulative effects of new development on air quality.

D. Require development projects to abide by the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines.

E. These measures would reduce exhaust and particulate emissions from construction and grading activities.

F. Reduce emissions from residential and commercial uses by requiring the following:

Use of high efficiency heating and other appliances, such as cooking equipment, refrigerators, and furnaces, and low NOx water heaters in new and existing residential units. Require the Building Division to maintain standards for these;

Compliance with or exceed requirements of CCR Title 24 for new residential and commercial buildings;

Incorporation of passive solar building design and landscaping conducive to passive solar energy use for both residential and commercial uses, i.e., building orientation in a south to southeast direction, encourage planting of deciduous trees on west sides of structures, landscaping with drought resistant species, and use of groundcovers rather than pavement to reduce heat reflection;

Use of battery-powered, electric, or other similar equipment that does not impact local air quality for non-residential maintenance activities;

Provide natural gas hookups to fireplaces or require residential use of EPA-certified wood stoves, pellet stoves, or fireplace inserts.

Current building code standards generally ban the installation of open-hearth, wood-burning fireplaces and wood stoves in new construction. It does, however, allow for the use of low-polluting wood stoves and inserts in fireplaces approved by the federal Environmental Protection Agency, as well as fireplaces fueled by natural gas.

5-P-13 Encourage existing major employers to develop and implement Transportation Demand Management programs to reduce peak-period trip generation.

A. Study the feasibility of a citywide TDM program that would be funded by annual fees or assessments on new development.

B. Assign a proportion of TDM fees to Petaluma Transit for expansion of service and future fare reductions or fare elimination.

C. As part of the development code, require TDM measures for all new non-residential development.

D. Assign trip reduction credits and reduced transportation impact fees for demonstrated commitment to TDM strategies.

E. Reduce parking requirements for mixed-use developments and for developments providing shared parking or a TDM program.

F. Establish a TDM program for City of Petaluma employees.

G. Collaborate with Santa Rosa Junior College to minimize the impact of future enrollment growth on local traffic and parking demand, such as though TDM measures, limitations on parking near the College and on-campus parking management.

H. Encourage provision of preferential parking in selected areas for designated carpools.

Mitigation Measures

There is no feasible mitigation that would reduce the impact to less than significant.

Impact 3.10-2: Implementation of the proposed General Plan may contribute substantially to an existing air quality violation. (Less than Significant)

Implementation of the proposed General Plan would result in new emissions being generated from construction activities and the operation of new land uses. The thresholds of significance that have been recommended by the BAAQMD for new operational emissions were developed for individual development projects. The BAAQMD operational emission limits are 80.0 pounds per day (ppd) of ROG, 80.0 ppd of NOX, and 80.0 ppd of PM_{10}. These thresholds apply to the operational emissions associated with individual projects only; they do not apply to construction-related emissions. The BAAQMD recommends that for General Plan amendments cities and counties must show consistency with regional plans and policies rather than the use of emissions limits (see Impact 3.10-1 for a discussion of consistency with the regional plan).

Under the proposed General Plan, a substantial amount of construction and development would occur every year until buildout of the proposed General Plan. Many of the individual projects would be small and generate construction and/or operational emissions that do not exceed the BAAQMD's recommended thresholds of significance. Although the City would not consider these projects to cause a potentially significant individual air quality impact, it would require each project to implement the proposed General Plan policies that address air quality in order to minimize emissions. Other projects would be large enough to generate construction and/or operational emissions that exceed these thresholds. Through the environmental review process for individual projects, the City will consider the potential for significant air quality impacts and will require the implementation of all applicable policies for the proposed General Plan to minimize emissions. Additional site-specific mitigation for these projects may also be required to further reduce emissions and potential impacts.

Proposed General Plan Policy 4-P-11(D) would require implementation of the recommended BAAQMD dust control measures for all projects constructed under the proposed plan, thereby reducing each project's contribution to existing air quality violations.

The proposed General Plan would also be expected to result in emissions associated with the development and operation of new residential and non-residential land uses within the City. Implementation of the proposed General Plan policies listed below would apply to activities associated with operation under the proposed General Plan. Specifically, emissions associated with traffic would be reduced by reducing the trip generation rate through land use and circulation policies to promote alterative transportation to the automobile and stationary source emissions would be reduced by Policy 4-P-11(F) through the use of high efficiency or low emission sources commonly used by residential and commercial uses.

Proposed General Plan Policies that Reduce the Impact

The following policies of the proposed General Plan would reduce potential air pollution emissions:

4-P-8 See Impact 3.10-1.

4-P-11 See Impact 3.10-1.

4-P-12 To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall include in construction contracts the following requirements or measures shown to be equally effective:

Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction;

Minimize idling time of construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment;

Use alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline);

Use add-on control devices such as diesel oxidation catalysts or particulate filters;

Use diesel equipment that meets the ARB's 2000 or newer certification standard for off-road heavy-duty diesel engines;

Phase construction of the project;

Limit the hours of operation of heavy duty equipment.

Mitigation Measures

None required.

Impact 3.10-3: Implementation of the proposed General Plan may result in a cumulatively considerable net increase of criteria pollutants for which the region is in nonattainment under an applicable national or State ambient air quality standard. (Less than Significant)

The BAAQMD CEQA Guidelines recommends that consistency of the proposed plan be used to determine the cumulative significance of land use projects (i.e., whether the contribution of a project is cumulatively considerable). As discussed previously, the Bay Area 2005 Ozone Strategy was prepared to accommodate growth, to reduce the high levels of pollutants within the Basin, to meet federal and State air quality standards, and to minimize the fiscal impact that pollution control measures have on the local economy. According to the BAAQMD CEQA Guidelines, projects that are consistent with the current attainment plan performance standards and emission reduction targets would be considered less than significant unless there is other pertinent information to the contrary.

The land use and circulation elements of the proposed General Plan include policies aimed at reducing air pollutant emissions from many sources within the City. These policies are consistent with the measures, programs, and policies of the 2005 Ozone Strategy. As discussed above, implementation of the proposed General Plan would incorporate land use policies promoting pedestrian-scaled design and circulation policies to promote use of alternative transportation such as bicycling, bus transit, and carpooling and would include policies encouraging transit-oriented development and TDM measures. Therefore, the proposed General Plan would be consistent with the 2005 Ozone Strategy measures and programs and would not result in a cumulatively considerable net increase of one or more criteria pollutants for which the project region is in nonattainment under an applicable federal or State ambient air quality standard, and this impact would be less than significant.

Impact 3.10-4: CO emissions associated with buildout of the proposed project may result in exposure of sensitive receptors to CO emissions. (Less than significant)

BAAQMD recommends the use of CALINE4, a dispersion model for predicting CO concentrations, as the preferred method of estimating pollutant concentrations at sensitive receptors near congested roadways and intersections. For each intersection analyzed, CALINE4 adds roadway-specific CO emissions calculated from peak-hour turning volumes to the existing ambient CO air concentrations. For this analysis, CO concentrations were calculated based on a simplified CALINE4 screening procedure developed by the BAAQMD. The simplified model is intended as a screening analysis in order to identify a potential CO hotspot and assumes worst-case conditions and provides a screening of maximum, worst-case CO concentrations.

Typical sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. When evaluating potential air quality impacts to sensitive receptors, the BAAQMD is primarily concerned with high localized concentrations of CO. Motor vehicles, and traffic-congested roadways and intersections are the primary source of high localized CO concentrations. Localized areas where ambient concentrations exceed federal and/or State standards for CO are termed CO "hotspots."

As shown in Table 3.10-5, implementation of the proposed General Plan is not expected to expose existing or future sensitive uses within the City to substantial CO concentrations. Based on CO modeling using the simplified CALINE4 methodology at the 19 intersections expected to operate at LOS D or worse, CO concentrations would be substantially below the national 35.0 ppm and State 20.0 ppm 1-hour ambient air quality standards, and the national and State 9.0 ppm 8-hour ambient air quality standards when growth envisioned under the proposed General Plan occurs. Therefore, sensitive receptors within the City would not be exposed to substantial pollutant concentrations, and the potential impacts of the proposed General Plan would be less than significant.

Proposed General Plan Policies that Reduce the Impact

Proposed General Plan policy from 4-P-8 (see Impact 3.10-1) of the proposed General Plan would reduce potential air pollution emissions.

Table 3.10-5: Carbon Monoxide Concentrations at Selected Locations

	Carbon Monoxide Concentrations (ppm)			
Intersection Roadway	*1-Hour Average Existing (2005)*	*1-Hour Average GP Update Buildout (2025)*	*8-Hour Average Existing (2005)*	*8-Hour Average GP Update Buildout (2025)*
Old Redwood Hwy/McDowell Blvd	4.5	3.3	2.6	1.9
Petaluma Blvd/Stony Point Rd/ Industrial Ave	4.0	3.1	2.3	1.8
Petaluma Blvd/Corona Rd	4.3	3.1	2.4	1.8
McDowell Blvd/Corona Rd	4.1	3.1	2.3	1.8
Sonoma Mountain Pkwy/ Washington Street	4.4	3.2	2.5	1.9
McDowell Blvd/Rainier Ave	4.1	3.3	2.4	2.0
McDowell Blvd/Washington Street	4.8	3.3	2.8	1.9
McDowell Blvd/Caulfield Lane	3.8	3.1	2.1	1.8
Washington Street/Ellis Street/ Kenilworth Drive	4.6	3.2	2.6	1.9
Caulfield Lane/Payran Street	4.0	3.2	2.3	1.9
Lakeville Street/Caulfield Lane	4.1	3.2	2.4	1.9
Washington Street/Lakeville Street	4.3	3.2	2.5	1.9
Lakeville Street/D Street	4.4	3.2	2.5	1.9
Petaluma Blvd/Shasta Ave	4.3	3.2	2.5	1.9
Petaluma Blvd/Payran Street/ Magnolia Ave	4.5	3.3	2.6	1.9
Petaluma Blvd/Washington Street	4.5	3.2	2.6	1.9
Petaluma Blvd/D Street	4.5	3.2	2.6	1.9
Lakeville Street/Lindberg Lane	3.9	3.1	2.2	1.8
Lakeville Hwy/Baywood Drive	4.9	3.4	2.8	2.0

National 1-hour standard is 35.0 parts per million. State 1-hour standard is 20.0 parts per million.
Federal 8-hour standard is 9.0 parts per million. State 8-hour standard is 9.0 parts per million.

Source: EIP Associates, 2006

Impact 3.10-5: Development and occupation of the proposed General Plan could result in placement of sensitive land uses near potential sources of objectionable odors, dust, or toxic air contaminants. (Less than Significant)

Odors, dust, or TACs can be emitted by stationary or area sources throughout the City. Trace quantities of TACs would be expected to occur with natural gas combustion related to buildout of the proposed General Plan. Additionally, diesel particulate emissions, a known TAC, could be emitted during operation of motor vehicles. To address these emissions, California ARB has recently finalized an Air Quality and Land Use Handbook: A Community Health Perspective (April 2005) as an "informational guide" to prioritize the important sources of TACs and reduce exposures to proximate populations. The handbook recommends adequate separation of sensitive receptors and potential sources of TACs, including diesel particulate matter, such as high traffic roads, distribution centers, and dry cleaners. The handbook also recommends separation for potential sources of odor and dust. General Plan Policy 4-P-13 would require buffer zones to prevent exposure of sensitive receptors; therefore, the effects of the toxic emissions from existing and future vehicle operations in the planning area are not expected to be substantial.

The occurrence and severity of potential odor impacts depend on numerous factors. The nature, frequency, and intensity of the source, the wind speeds and direction, and the sensitivity of the receiving location each contribute to the intensity of the impact. While offensive odors rarely cause any physical harm, they can be unpleasant and cause distress among the public and generate citizen complaints. Managing sources of odors is accomplished by regulatory requirements and appropriate land use planning. Sources that generate odors that travel into adjacent properties are regulated by the provisions of BAAQMD Regulation 7, Odorous Substances. In addition, Policy 4-P-13 would require buffer zones to prevent exposure of sensitive receptors to odor producing sources.

Dust can be a common byproduct of agricultural activities. As with odors, potential impacts from agricultural dust depend on the frequency and intensity of the source, wind speeds and directions, and the sensitivity of the receiving location. In order to minimize distress among the public and citizen complaints, land use planning strategies should aim to protect residents from sources of agricultural dust. BAAQMD Regulation 6 addresses control of visible emissions. In addition, Policy 4-P-13 would require buffer zones to prevent exposure of sensitive receptors to agricultural dust.

Proposed General Plan Policies that Reduce the Impact

The following proposed policies from the proposed General Plan would reduce potential air pollution emissions:

4-P-11 See Impact 3.10-1.

4-P-13 To avoid potential health effects and citizen complaints that may be caused by sources of odors, dust from agricultural uses, or toxic air contaminants the following measures would be necessary:

> Locate new stationary sources of air pollutants, such as industrial facilities, at sufficient distances away from residential areas and facilities that serve sensitive

receptors to avoid significant impacts caused by odors, dust, and toxic air contaminants.

Include buffer zones within new residential and sensitive receptor site plans to separate those uses from potential sources of odors, dust from agricultural uses, and stationary sources of toxic air contaminants.

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3.11 VISUAL RESOURCES

This section presents the environmental setting and impact analysis for visual resources in the Petaluma Planning Area. It evaluates how implementation of the General Plan policies will affect the city's visual and aesthetic character, including scenic views of Sonoma Mountain, the foothills, and Petaluma River.

ENVIRONMENTAL SETTING

Petaluma is a visually rich community, located along the Petaluma River, with a backdrop of hills to the west and south, and vistas of Sonoma Mountain to the east. These natural features contribute to a variety of visual resources for local residents.

Urban Form

Petaluma is oriented along the northwest-southeast axis formed by the river, railroad tracks, and U.S. 101. Commercial and industrial uses are gathered along these transportation corridors—heavy industry is clustered along the river, business parks and light industry are located along U.S. 101, and shopping centers line important city arterials. The older residential neighborhoods southwest of the river, the small housing lots between the river and U.S. 101, and newer suburban subdivisions to the east and northeast occupy the bulk of the land on either side of the city's main transportation routes.

The heart of Petaluma is its downtown, which includes a Victorian district on the National Register of Historic Places. Established in the mid-1800s, Downtown Petaluma was developed with a grid of regular streets and small blocks. Today, its historic structures, a walkable street scale, and a number of entertainment businesses and restaurants continue to make it an important district in the city.

Streets

A grid of streets—such as Western Avenue, D Street, and Washington Street—radiating from the river provide access to the central portions from other parts of the city and the surrounding countryside. Significant gateways or points of entry to the city occur along U.S. 101 and most of the arterials; the character of these is important in creating the image Petaluma presents on arrival. No state scenic highways, however, traverse the Planning Area.

Views

Topography plays a key role in shaping Petaluma's character. The city lies in the Petaluma River Valley, which extends northwest-southeast between Sonoma Mountain (approximately 2,300 feet above sea level) and Mount Burdell (approximately 1,560 feet above sea level). Foothills rising to these peaks flank the city, providing views of rolling landscapes and agricultural uses. Views of the hills create a sense of identity for city residents, local businesses, and visitors. Figure 3.11-1 illustrates the city's topography and resulting viewsheds from several different locations. In addition to these scenic vistas, Petaluma is traversed by the Petaluma River and several creek corridors that contribute to the city's aesthetic quality. The Petaluma River, whose headwaters are several miles to the north of the city, flows through gently sloping farmland, then through the center of Petaluma, and finally through rich marshlands as it makes its way to San Pablo Bay.

REGULATORY SETTING

Petaluma's surroundings are protected by political boundaries constraining its municipal borders. The city's UGB limits future development to areas immediately adjacent to, or within, the city's current boundaries until 2018. Land that lies outside of Petaluma's UGB is subject to Sonoma County's land use regulations, including the Sonoma County Community Separators that provide open space buffers between urbanized areas within the County. In this way, community separators service to protect the hills and scenic areas surrounding the city.

IMPACT ANALYSIS

Significance Criteria

Petaluma's General Plan would have a significant adverse effect on visual resources if it would cause one or more of the following:

> Have a substantial adverse effect on a scenic vista (which could be caused by blocking panoramic views), views of significant landscape features, or landforms as seen from public viewing areas;
>
> 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 study area and its surroundings; or
>
> Create a new source of substantial light and glare, which would adversely affect day or nighttime views in the area.

Generally, the greater the change from existing conditions, the more substantial the impact. For example, the construction of a new development on open rural land usually has a greater visual impact than redevelopment on infill land. Likewise, the construction of a new roadway generally has a greater visual impact than the widening of an existing one. New development and redevelopment can have significant local impacts where they would require the removal of trees and other important landscape buffers or other contrasting visual elements.

Methodology & Assumptions

To evaluate the potential impacts on hillside visual resources and the Petaluma River Valley, a viewshed analysis was done, using three key "viewpoints" within the City of Petaluma: Washington Street overpass, McNear Peninsula, and Rocky Memorial Dog Park. Hillside viewsheds were identified with a digital elevation model and topographic data from the U.S. Geologic Survey to determine what hills and ridgelines were visible from each viewpoint. For the purposes of this analysis, the 300-foot elevation was established as representing the base of the hills. These viewpoints were assumed to represent a reasonable range of potential viewpoints and so provide a basis for evaluating potential effects of proposed Plan policies on visual resources in the Planning Area.

Fig. 3.11-1

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Summary of Impacts

Within the built city, infill development or redevelopment of existing development would not have a significant effect on the visual quality of the city, including the river, because new development would likely be similar in scale and character to existing development. This infill development likewise would not be expected to have a substantial adverse impact on panoramic views or create incongruous visual elements because the height and massing of new development would be similar to existing development. In addition, due to the city's UGB and the County's Community Separators and other policies designed to protect significant visual resources, hillside development would be minimal and unlikely to substantially alter the visual character of the foothills surrounding the city.

Impacts and Mitigation Measures

Impact 3.11-1 New development may block views of Sonoma Mountain and ridgelines and/or alter the visual character of the hillsides. (Less than Significant)

Various points throughout Petaluma have views of the western ridgelines as well as Sonoma Mountain. Because most development in the city is two stories or less in height, many streets and parks have views of the hillsides, although some views are framed and partially obscured by buildings and trees. Views from areas within developed neighborhoods would generally not change, with the potential exception of areas adjacent to infill sites. Overall, public views would not be significantly altered or blocked.

Allowing urban development within existing vacant hills would alter the visual character of the open slopes. However, residential development currently approved or proposed for the foothills is restricted primarily to Rural Residential and Very Low Residential development (less than 2.0 units per acre). The key viewpoint analysis at McNear Peninsula, Rocky Memorial Dock Park, and East Washington Overpass indicated that new development would not block scenic vistas or viewsheds. The impacts of development on visible hillsides would be minimal because the General Plan policies call for protecting these ridgelines and visible hillsides from inappropriate development and preserving these viewsheds. The visible hillsides potentially affected by development are illustrated in Figure 3.11-1.

Proposed General Plan Policies that Reduce the Impact

Proposed General Plan policies seek to minimize future impacts of hillside development on views of the foothills. The following proposed policies would reduce Impact 3.11-1:

2-P-14 Allow development in hillside areas that preserve ridgelines and are site sensitive.

A. Establish development and design standards related to residential development in hillside areas that address:

Location of hillside residential units, including preserving ridgelines.

Clustering provisions to preserve open space, natural assets (woodlands, creeks, etc.).

Building development and design in a clustered format, including standards for building height and massing.

Provisions for clustered development, including amount of bonus, alternate development forms, common recreational facilities, phasing, etc.

B. Enhance the hillside development regulations in the Development Code to include:

Regulating development density by degree of hillside slope.

Protecting unique natural features, including landforms, mature trees, and ridge lines, by requiring location of structures away from these assets.

Encouraging architectural design that reflects the natural form of the hillside setting, in order to minimize visual and environmental impacts.

Preventing the significant alteration of hillside topography through grading and paving.

Use of visually unobtrusive building materials.

2-P-15 Retain ridgelines and prominent hillsides as open space through clustering and transfer of density to other parts of a development site (applies to Rural and Very Low Residential areas within the West Hills, South Hills and Petaluma Boulevard North subareas only).

3-P-63 Extend the Urban Separator.

To the extent feasible, provide an area up to 300-feet in width along the eastern boundary of the South Hills subarea by requiring dedication of land as Urban Separator, while allowing density transfers from the Urban Separator to the developable portion of individual sites.

Develop a strong gateway at I Street with landscape treatment and views of the Petaluma Valley.

Preserve the existing public viewsheds featuring the Petaluma community.

10-P-3 Regulate the grading and development of hillside areas for new urban land uses, by instituting a Hillside Overlay or other similar mechanism in the Development Code. Ensure that new development on hillsides is constructed to reduce erosion and landslide hazards:

Limit cut slopes to 3:1, except where an engineering geologist can establish that a steeper slope would perform satisfactorily over the long term.

Encourage use of retaining walls or rock-filled crib walls as an alternative to high cut slopes.

Ensure revegetation of cut-and-fill slopes to control erosion. Plant materials for revegetation should not be limited to hydro-seeding and mulching with annual grasses. Trees add structure to the soil and take up moisture while adding color and diversity.

Ensure blending of cut-and-fill slopes within existing contours, and provision of horizontal variation, in order to mitigate the artificial appearance of engineered slopes.

Ensure structural integrity of sites previously filled before approving redevelopment.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.11-2 New development and intensification along the Petaluma River could adversely affect the visual character of this natural resource. (Less than Significant)

In areas along the Petaluma River, new development could result in buildings and structures that are larger in height and mass than existing development. Changes in visual character, for example, could occur along the Rainier Avenue extension, where residential and mixed use development would replace undeveloped lots at higher densities and intensities than are allowed under the existing general plan.

Policies in the proposed General Plan, however, ensure that any new development along the river incorporate design approaches consistent with the Petaluma River Access and Enhancement Plan. General Plan policies call for appropriate setbacks, improving connections to the river, and fronting development along the river. In addition, many sites along the river will be subject to a discretionary review process. These policies, and others, would help achieve the expressed goal of enhancing the city's visual centerpiece, as well as one of its major natural resources.

Proposed General Plan Policies that Reduce the Impact

2-P-36 An area shown as the Petaluma River Corridor (PRC), along the Petaluma River, shall be set aside for the creation of flood terraces where appropriate, preservation, expansion, and maintenance of flood storage capacity of the floodplain, habitat conservation, and public access.

3-P-37 The Petaluma River Corridor (PRC) shall be dedicated to the City, improved and maintained in perpetuity by the development as adjacent development occurs.

A. Design Standards shall be developed for the Petaluma River Corridor.

B. Maintenance of the PRC shall be assured through the creation of a funding mechanism such as citywide surface water utility fee or Landscape Assessment District.

C. All development within the PRC shall be subject to a discretionary review process.

2-P-38 Development shall incorporate the River as a major design focal point, orienting buildings and activities toward the River.

2-P-39 Develop the Petaluma River as a publicly-accessible green ribbon, fronted by streets, paths, and open spaces, by implementing the Petaluma River Access and Enhancement Plan within the context of the PRC Design Standards.

3-P-28 Foster connections to the river from surrounding areas and ensure that new development adjacent to the river is oriented toward it.

3-P-32 Promote greater accessibility to the Petaluma River and vacant lands through road extensions, bikeways, and trails, including:

Extending Burlington Drive northward across Lynch Creek, and consider other options to extend streets through to new developments.

Requiring new development to be oriented to the river, and providing continuous public access to the riverfront.

3-P-35 Provide gateway improvements both east and west of the Highway 101 overcrossing.

D. East of Highway 101, undertake a streetscape improvement program that incorporates new trees and vegetation, while maintaining a visual and physical connection to the Petaluma River.

E. Preserve and expand river-dependent industrial uses, while improving appearance and screening from Petaluma Boulevard South.

F. Develop the terminus of the Caulfield Lane "southern crossing" with Petaluma Boulevard South as an emphatic gateway, with methods—such as a roundabout and more defined lane widths—to slow traffic and define entrance into the community and new neighborhoods.

3-P-36 Provide vistas eastward to the Petaluma River and across toward Sonoma Mountain.

3-P-50 Develop the Petaluma River as a publicly-accessible green ribbon, fronted by streets, paths, and open spaces, by implementing the Natural Environment and Water Resources elements and the Petaluma River Access and Enhancement Plan.

3-P-51 Foster connections to the river from surrounding areas and ensure that new development adjacent to the river is oriented toward it.

3-P-52 Use the Petaluma River Access and Enhancement Plan as the tool to implement the Petaluma River Corridor by maintaining setbacks, creating flood terraces where appropriate, and preserving floodplain and habitat conservation areas and other open spaces along the river.

3-P-53 Promote greater accessibility and views to Petaluma River through road extensions, bikeways, and trails, including:

Requiring new development to be oriented to the river, and provide continuous public access parallel to the riverfront.

Extending Industrial Avenue south of Corona Road.

Requiring a new pedestrian/bicycle connection to the river east of Jessie Lane and intersecting with Petaluma Boulevard North.

Requiring a new street connection to the river at, or near, the intersection of Gossage Avenue.

Requiring paths from the area of Jessie Lane southwest toward Magnolia Avenue to link with existing neighborhoods.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.11-3 New development and redevelopment activities may potentially degrade the existing visual quality of the city through incompatibilities with existing development in scale and/or character. (Less than Significant)

The aesthetic resources of the city—the creeks, river, hillsides, and ridgelines—could potentially be impacted by new development unless it is thoughtfully designed. Preservation of significant natural features during construction of new development would help retain the character of existing areas. New development proposed on vacant sites within the city's UGB could also alter the surrounding rural visual character through increased densities and intensities.

The proposed General Plan would contain several policies and programs specifically designed to minimize negative aesthetic impacts. The policies would help establish design standards that the City would like to achieve, including pedestrian connections, encouraging new development to be contiguous with existing development, and maintaining significant views. Implementation of the following General Plan policies would reduce potential scale and character effects and ensure that existing visual quality is preserved.

Proposed General Plan Policies that Reduce the Impact

2-P-3 Preserve the overall scale and character of established residential neighborhoods.

A. In addition to density standards, establish building intensity (floor area ratio) standards for residential development in the Diverse Low and Medium Density Residential districts, to prevent development out of scale with existing neighborhood context.

Actual standards are to be developed and maintained in the City's Development Code.

3-P-42 Maintain the rural character to the west of this corridor [Petaluma Boulevard North, north of Shasta Avenue] by limiting density to primarily Rural Residential uses west and north of Gossage Avenue, and Low Density Residential uses south.

3-P-56 Preserve the rural aspect of the area by maintaining the existing density (Rural, Very Low and Low Residential) and land use patterns. A decrease in density through minimum lot sizes within the Development Code can achieve the desired transition.

3-P-99 Allow lot consolidation in residential areas only when finding that this will not negatively impact the existing neighborhood character.

6-P-6 Neighborhood parks are donated, constructed, and maintained within the developing property (ies). In addition to the donation and improvements, park impact fees shall be paid to offset costs associated with developing, upgrading, and maintaining community parks. Transfer of density from the donated park acreage may be considered where deemed appropriated by the City Council.

Revise the City's Municipal Code to require dedication of neighborhood park land, and construction of associated neighborhood park improvements, in addition to the payment of park impact fees, eliminating the reimbursement component for neighborhood parks.

Establish a transfer of development rights (TDR) program that allows project proponents on whose sites new parkland locations are designated, to transfer development rights from portions of the site dedicated as public open space/park

beyond required dedication/in lieu requirements (5 acres per 1,000 residents) to the remainder of the site at a ratio of 1.5 x base land use designation on the site, subject to approval by the City Council and provided the following criteria are met:

The resulting park area meets the minimum size and location requirements shown in Table 6.1-8 and Figure 6-1;

The park/open space is useful for recreational use, and not just leftover acreage;

The park/open space is physically and perceptually available to the community-at-large, and not internal to the development;

The resulting transfer will not unduly impact the character of the neighborhood where the development is located; and

The park/open space is not at the city's edge, adjacent to an urban separator.

For example, a 15-acre site with Medium Density Residential designation (base of 8.1 housing units per acre) that provides a three-acre public park, transfer of development rights shall be as follows:

Base housing units permitted=15*8.1=122

Assuming half the units are single family and half multifamily, dedication/in lieu fee requirement =61*2.915/1,000+61*1.963/1,000 = .30 acre

Excess parkland provided= 3.0-0.30= 2.7 acres

Mitigation Measures

No additional mitigation measures are required.

3.12 CULTURAL RESOURCES

This section presents the environmental setting and impact assessment for cultural resources. 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.

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 Euro American 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 are standing structures of historic or aesthetic significance that are generally 50 years of age or older (i.e., anything built in the year 1955 or before). In California, historic resources considered for protection tend to focus on architectural sites dating from the Spanish Period (1529-1822) through the early years of the Depression (1929-1930). Historic resources are often associated with archaeological deposits of the same age.

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.

The following cultural, historical, and ethnographic baseline information is extracted from an overview document prepared by the Northwest Information Center at Sonoma State University, as well as information provided by the City of Petaluma.[1]

ENVIRONMENTAL SETTING

Physical Setting

Prehistoric Context

The Petaluma River Valley has been the location of human settlement for hundreds of years. Its fertile soils and abundant wildlife provided sustenance, while the River acted as a natural transportation route to the south. Its first inhabitants were native Coast Miwok tribes, who were followed by European settlers.

1. Northwest Information Center, Sonoma State University, December 17, 2001.

Prehistoric Resource Sites

A review of the Petaluma UGB conducted by the Northwest Information Center found 21 recorded Native American archaeological resources and historic cultural resources listed with the Historical Resources Information System.

Native American archaeological sites in this portion of Sonoma County tend to be situated along ridgetops, midslope terraces, alluvial flats, near ecotones, and near sources of water, including springs. The project area, which includes the Petaluma River, encompasses all of the environmental features listed above. The recorded Native American archaeological sites within the planning area range from sparse lithic scatters to large village sites represented by extensive habitation debris and human burials. In addition, three Native American ethnographic villages, Tuchayelin, Likatuit, and Etem, are known to have existed in the planning area. Given the environmental setting and the archaeologically sensitive nature of the general area, there is a high potential for Native American sites within the planning area.

Historic Context

Contemporary Petaluma began as a settlement over 150 years ago when the burgeoning City of San Francisco began to place increasing demands on the surrounding region to supply food and supplies. In 1850, a group of hunters established a primitive camp on the west bank of the Petaluma River, near the present-day Lakeville Street Bridge. These pioneers were soon followed by others seeking access to the hunting fields and ranch lands in Bodega Bay and the Point Reyes area. As an increasing number of settlers negotiated the complex meanders of the River, a trading post was built and settlement began. Buildings were clustered along the River, on the block of Main Street (now Petaluma Boulevard North) between Washington Street and Western Avenue. By 1852, a squatter named Keller surveyed the town and platted a 40-acre site extending north from Western Avenue to Galland Street and east from Liberty Street to the River. The Hopper Street (Lakeville) Bridge was built in 1853, and the East Washington Street Bridge was built in 1857. Petaluma incorporated in 1858 with approximately 1,340 residents.

For a few decades, the old east side of Petaluma remained as undeveloped property held by the rail companies and was subject to flooding. After it was platted, development began to occur on this side of the city, and the river became the central feature and focal point for neighborhoods on the periphery of the Central Petaluma area. The east bank of the river began to take on a more commercial/industrial character flanked by residential neighborhoods, comprising a large area known for years as "Old East" Petaluma. Rail service shifted to the east bank of the River and was slowly extended in increments up the coast until it reached Eureka in 1914. Rail service was abandoned for a long while on the west bank, as the Main Line and the Depot were established on the east.

In Petaluma's early days, the banks of the Petaluma River were crowded with piers and boat landings and local manufacturing businesses, such as tanneries, flour mills, carpentry shops, and wagon-making shops. However, with the growth of the dairy and poultry industries, the riverfront began to change and evolve into a thriving center of agricultural businesses. Petaluma expanded beyond its role as the general shipping point for the produce of Sonoma and Mendocino Counties and became a center of intensive production as well. However, once the Golden Gate Bridge was built in 1936, and the subsequent suburbanization that took place

following World War II, Petaluma began to transform in character, becoming more of a bedroom community to the Bay Area.

Historic Resource Sites

According to the records search conducted by the Northwest Information Center, there are an extensive amount of listed National Register of Historic Places properties within the planning area, many of which are located in the Petaluma Historic Commercial District (see below). Individual properties that have been listed on the National Register include:

Free Public Library (now Petaluma Museum) of Petaluma at 20 Fourth Street (Old Carnegie Library)

Old Petaluma Opera House at 147-149 Kentucky Street

Petaluma Silk Mill at 420 Jefferson Street

Philip Sweed House at 301 Keokuk Street

United States Post Office at 120 Fourth Street

The Free Public Library, Old Petaluma Opera House, and the Petaluma Silk Mill are all associated with the architect Brainard Jones, a locally prominent architect practicing in Petaluma and the surrounding communities from 1900 to 1945. Several buildings in the Petaluma Historic Commercial District are also attributed to him, including 246/252 Petaluma Boulevard, as well as other homes and buildings located throughout Petaluma.

Additional landmarks were identified through October 2001 community workshops and by consultants. These include industrial "working towers", the Great Petaluma Mill, the old railroad depot, Foundry Wharf, the Balshaw Bridge, and the Turning Basin. The River itself is one of the most important features in Petaluma, providing a sense of direction and history, as well as a natural resource.

Special Neighborhoods (see Figure 3.12-1 Historic Districts exhibit)

Petaluma Historic Commercial District

The Petaluma Historic Commercial District was listed in the National Register of Historic Places in March 1995, and contains a total of 96 registered buildings on 174 acres of land (see Figure 3.12-1).[2] More precisely, the district contains 63 contributing buildings, 33 non-contributing buildings and one contributing object.[3]

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2. National Register of Historic Places, Sonoma County Historic Districts, www.nationalregisterofhistoricplaces.com/CA/Sonoma/districts.html, November 9, 2005.

3. A contributing building is a structure generally constructed before 1945 that retains its original architecture, scale, mass, and other features to the degree that it contributes to the historical sense of time and place of the district. A non-contributing building is a structure that was either constructed after the defined period of significance, in this case 1945 or later, or is a historic building that no longer conveys its significance due to inappropriate additions or alterations.

According to the National Register, for a building to be listed on the National Register of Historic Places, either individually or as part of a district, means it must be determined to be historically significant for its association with an important event, person and/or architectural style. For a property to qualify for the National Register it must meet the National Register Criteria for Evaluation by being associated with an important historic context and retaining the historic integrity of those features necessary to convey its significance. Petaluma's Historic Commercial District represents the development of commerce in the City from the mid-nineteenth century to the end of World War II and it provides a diverse and well-designed collection of commercial buildings.[4]

Petaluma's Historic Commercial District contains structures built from the 1850s through the 1950s. Architectural styles represented include Italianate and Classical Revival, and several buildings built with iron cladding, considered a fireproofing safeguard at the time of its use. Among the architecturally, commercially, and historically significant buildings in this area are the Post Office (1870); the Old Opera House (1870); the McNear Building, constructed in two pieces and housing the Mystic Theater (1886 and 1911); and the Steiger Building, home of Petaluma's first general store (1850s).

Oakhill-Brewster and "A" Street Architectural Preservation Districts

The City has identified The Oakhill-Brewster and "A" Street neighborhoods as historic districts and has developed Preservation Guidelines and Standards for them. The guidelines mandate that all additions, restorations, alterations, or reconstructions be consistent with each structure's original architecture and design. New construction in the districts must reflect the historic character of the districts, using parameters of scale, materials, and detailing typical of pre-1930s structures. Accessory structures are to match their principal structures in style. Setbacks, building height, rooflines, and facades should be consistent with immediately adjacent structures. Texture and materials are to be as historically accurate as possible, and landscaping and fencing harmonious with the building architecture in the immediate surrounding area.

The Oakhill-Brewster Historic District encompasses one of the earliest residential neighborhoods in Petaluma, northwest of Downtown. The neighborhood represents most major residential styles from the 1850s through the 1980s, in a nearly continuous fabric of vintage architecture. Cobblestone curbs and gutters and rusticated ashlar retaining walls along sidewalks help provide visual consistency throughout the District.

Oakhill-Brewster architectural styles include Greek Revival (1850-1865); Gothic Revival (1860-1880); Italianate (1860-1885); Stick Style (1880-1890); Queen Anne (1880-1910); Shingle Style (1880-1910); Beaux Arts (1885-1940); Italian Renaissance Revival (1895-1935); Classical Revival (1895-1915); Prairie (1900-1920); Craftsman (1905-1930); Colonial Revival (1910-1955); Period Revival (1915-1940), International Style (1925-1985); War-era Suburban (1940-1950); and Ranch Style (1940-1975).

4. City of Petaluma, *Petaluma Historic Commercial District Design Guidelines*, August 1999.

The "A" Street Historic District is an area of about six city blocks just south of Downtown. The District contains residences, offices, churches, and apartments. Unifying factors include the age of the District's structures, nearly all built before 1925, and their architectural significance.

Figure 3.12-1: Historic Districts

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Architectural styles found in the "A" Street Historic District include examples of nearly every popular type between 1860 and 1925, including Greek Revival (1850-1865); Gothic Revival (1860-1880); Italianate (1860-1885); Stick Style (1880-1890); Queen Anne (1880-1910); Shingle Style (1880-1900); Colonial Revival (1880-1940); Georgian Revival (1880-1940); Neo-Classical Revival (1895-1950); Craftsman (1905-1930); Spanish Colonial Revival (1915-1940); and Period Revival (1920-1940).

Petaluma Adobe State Historic Park

The Petaluma Adobe State Historic Park is located at the intersection of Old Adobe Road and Casa Grande Road, northeast of the City limits. This 41-acre park features the main residence of the Rancho Petaluma – the fertile 66,000-acre ranch owned by General Mariano Guadalupe Vallejo in the mid 1800s. The main economic activity of the ranch involved the hide and tallow trade that helped make the General one of the richest, most powerful men in the Mexican Province of Alta California from 1834 to 1846. Today, the main house contains authentic furniture and interpretive displays representing aspects of life on Vallejo's ranch. The building is registered as State historical landmark number 18.[5]

REGULATORY SETTING

In the State of California, the process of reviewing projects and decisions that may impact cultural resources including historic, archaeological, and paleontological resources is conducted under several different federal, state, and local laws. At the federal level, the Office of Historic Preservation (OHP) carries out reviews under Section 106 of the National Historic Preservation Act of 1966, as amended. CEQA requires that public agencies consider the effects of their actions on historical resources eligible for listing on the California Register of Historical Resources. Additionally, California Public Resources Code Section 5024 requires consultation with OHP when a project may impact historical resources located on State-owned land.

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 archaeological studies within the project area, as well as provide recommendations for further work, if necessary. Depending on the

5. California Office of Historic Preservation, http://ohp.parks.ca.gov/default.asp?page_id, November 9, 2005.

nature and location of the project, the project proponent or lead agency may also want 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 should be evaluated for significance. For archaeological sites, a significance evaluation typically involves conducting test excavations. For historical sites or structures, historical research should be conducted and an architectural evaluation may be warranted. If significant, the resource should be protected from adverse impacts. Data recovery excavations may be warranted in the case of unavoidable damage to archaeological sites. If human burials are present, the appropriate Coroner's office should be contacted. A professional archaeologist and appropriate Native American representatives should also be consulted.

When an initial study identifies the existence, or the probable likelihood, of Native American human remains within the project area, 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.

At the local level, the City of Petaluma maintains a Historical and Cultural Preservation Committee that is composed of the members of the Site Plan and Architectural Review Committee plus one member from the Petaluma Heritage Homes and one representative of the Petaluma Historical Library/Museum. The duties and powers of the committee include promoting preservation of historic resources associated with the City of Petaluma; recommending to the Planning Commission that certain sites be designated as historic resources; advising the City Council on the administration of historic sites and landmarks; and advising the City Council on all matters relating to the historic and cultural preservation of the City, in particular State and federal designations and registration of historical landmarks.

IMPACT ANALYSIS

Significance Criteria

The Proposed General Plan would result in significant community design and character impacts if it would cause:

> Substantial changes to the significance of a historical resource, defined as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historic resource would be materially impaired (Guidelines §15064.5);
>
> Substantial changes to the significance of an archaeological resource;
>
> Direct or indirect destruction of a unique paleontological resource; or

Disturbance of any human remains, including those interred outside of formal cemeteries.

Methodology & Assumptions

A complete records search was conducted by the Northwest Information Center at Sonoma State University, which reviewed the State of California Office of Historic Preservation records, base maps, historic maps, and literature for Sonoma County on file. In addition, historic resources information gathered during a survey conducted by Carey & Co. in 2001 for the Central Petaluma Specific Plan has been incorporated into this EIR.[6]

Because this EIR is a Program EIR on a general plan, site-specific analysis of potential impacts on cultural and historical resources is not appropriate. Instead, this analysis identifies the type and magnitude of impacts that may result from the proposed General Plan as a whole.

Summary of Impacts

The primary impact that could occur would be disturbance of cultural resources during development of property, subsequent to the adoption of the General Plan. Specific projects implied through General Plan policy will require supplemental environmental analysis prior to implementation, in compliance with CEQA requirements.

According to the Northwest Information Center at Sonoma State University, there is a high possibility of uncovering and identifying additional archaeological deposits in the General Plan area and of impacting existing historic buildings. Existing national, state, and local laws as well as policies in the proposed General Plan would reduce these potential impacts on historic and archaeological resources to less than significant levels. No known significant paleontological resources exist in the study area.

Impacts and Mitigation Measures

Impact 3.12-1 New development proposed under the General Plan has the potential to disrupt undiscovered archaeological resources. *(Less than Significant)*

A complete records search revealed that 21 recorded Native American and historic cultural resources are currently located within the UGB. According to the Northwest Information Center at Sonoma State University, there is a high possibility of uncovering and identifying additional historic-period archaeological deposits on undeveloped land within the UGB. New development that occurs within these likely archaeological deposit sites may adversely affect those archaeological resources either during construction or once inhabited.

While project-specific studies will be necessary to determine the actual potential for significant impacts on archaeological resources resulting from the implementation of the proposed General Plan, some general impacts can be identified based on the probable locations of new development in the UGB and known geographic features near which prehistoric resources are most likely to be located. Projects in the vicinity of ridgetops, midslope terraces, alluvial flats, ecotones, and

6. Carey & Co. Architecture, Inc., *Petaluma Specific Plan Draft Historic Resource Evaluation*; October 2001.

sources of water have the greatest possibility of encountering a prehistoric archaeological resource.

Proposed General Plan Policies that Reduce the Impact

Overall, current federal, state and local laws as well as the following policies in the proposed General Plan would reduce these impacts on archaeological resources to less than significant levels.

3-P-7 Protect significant historic and archaeological resources for the aesthetic, educational, economic, and scientific contribution they make to Petaluma's identity and quality of life.

A. Maintain the character of the Petaluma Historic Commercial District, which is listed on the National Register of Historic Places, by adhering to the city's Historic Commercial District Design Guidelines.

B. Maintain the Oak Hill-Brewster Historic and "A" Street Historic districts as local architectural preservation districts.

C. Develop floor area ratio and other design standards that relate overall building size and bulk to site area for Downtown, the Oak Hill-Brewster Historic District, and "A" Street neighborhoods.

D. Develop historic preservation guidelines or standards for protecting historic quality structures that are not located within an existing historic district through initiating, requiring and/or encouraging formation of additional historic districts.

E. The loss of existing and potential historic structures shall be minimized through strict enforcement of City policies requiring proposed demolition be reviewed by the Historic and Cultural Preservation Committee. All means shall be used to encourage preservation and/or adaptive reuse or restoration of structures built in 1945 or earlier (Resolution 2005-198 N.C.S. as thereafter amended).

F. Ensure the protection of known archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archaeologically sensitive for Native American and/or historic remains.

G. In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological remains are discovered.

Mitigation Measures

No additional mitigation measures are required.

Impact 3.12-2 New infill development within previously built up areas in the City has the potential to impact sites of local historic importance and the overall historic setting of downtown. (Less than Significant)

A majority of the City's historic resources, including the many resources within the Petaluma Historic Commercial District, are located in proximity to the downtown Petaluma area. While registered historic sites are protected by State law, this downtown intensification could potentially threaten additional historic structures not yet registered or deemed eligible for the National Register of Historic Place, but which are sites of local importance. Furthermore, new development has the potential to impact the overall character of the historical setting.

Proposed General Plan Policies that Reduce the Impact

The following proposed General Plan policies would ensure protection of these sites of local historical importance and overall character by requiring new development downtown to be compatible with existing historic character, avoiding any potentially significant adverse impacts.

3-P-7 Protect significant historic and archaeological resources for the aesthetic, educational, economic, and scientific contribution they make to Petaluma's identity and quality of life.

A. Maintain the character of the Petaluma Historic Commercial District, which is listed on the National Register of Historic Places, by adhering to the city's Historic Commercial District Design Guidelines.

B. Maintain the Oak Hill-Brewster Historic and "A" Street Historic districts as local architectural preservation districts.

C. Develop floor area ratio and other design standards that relate overall building size and bulk to site area for Downtown, the Oak Hill-Brewster Historic District, and "A" Street neighborhoods.

D. Develop historic preservation guidelines or standards for protecting historic quality structures that are not located within an existing historic district through initiating, requiring and/or encouraging formation of additional historic districts.

E. The loss of existing and potential historic structures shall be minimized through strict enforcement of City policies requiring proposed demolition be reviewed by the Historic and Cultural Preservation Committee. All means shall be used to encourage preservation and/or adaptive reuse or restoration of structures built in 1945 or earlier (Resolution 2005-198 N.C.S. as thereafter amended).

F. Ensure the protection of known archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archaeologically sensitive for Native American and/or historic remains.

G. In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological remains are discovered.

Mitigation Measures

No additional mitigation measures are required.

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3.13 HAZARDOUS MATERIAL

This section of the EIR assesses potential adverse environmental, health, and safety impacts that could be caused by exposure to hazardous materials resulting from implementation of the proposed General Plan. Potential hazards include disturbing contaminated soil or groundwater and handling hazardous materials. Hazardous materials are chemicals or substances that pose hazards to human health or safety, or to the environment, particularly if released. Hazardous wastes are a subset of hazardous materials that pose potential hazards to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

ENVIRONMENTAL SETTING

Hazardous Materials and Wastes

A number of properties may cause a substance to be considered hazardous, including toxicity, ignitability, corrosivity, or reactivity. A substance is defined as hazardous if it appears on a list of hazardous materials prepared by a federal, State, or local regulatory agency, or if it has characteristics defined as hazardous by such agency.

The California Department of Toxic Substances Control (DTSC) defines the term "hazardous material" as a substance or combination of substances that, because of its quantity, concentration or physical, chemical, or infectious characteristics, may either: 1) cause, or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating illness; or 2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, disposed of, or otherwise managed.

A "hazardous waste" is any hazardous material that is abandoned, discarded, or recycled (California Health & Safety Code Section 25124). The same criteria that render a material hazardous make a waste hazardous: toxicity, ignitability, corrosivity, or reactivity.

Toxic, ignitable, corrosive, and reactive materials are all subsets of hazardous materials and wastes. For example, if a material is toxic, it is hazardous, but not all hazardous materials are toxic. Specific tests for toxicity, ignitability, corrosivity, and reactivity are set forth in Title 22, California Code of Regulations, Sections 66693 through 66708.

Existing hazardous materials in Petaluma include underground storage tanks, Polychlorinated Biphenyls (PCBs), asbestos, and pesticides. These and similar materials will require continued management under the proposed General Plan. Exposure pathways, risk assessment, and the institutional framework related to hazardous materials are explained in this section.

PHYSICAL SETTING

The study area for hazardous materials, including hazardous wastes, is the same as the boundary of the Planning Area. Although the long-term effects of improperly treating, storing, transporting, disposing of, or otherwise managing hazardous materials can be regional in scope (watershed or air basin, for example) and are regulated at the State and federal levels, activities

involving such materials in the City of Petaluma need to be examined and explained within the context of the implementation of the proposed General Plan.

Existing hazardous materials and/or wastes within Petaluma include underground storage tanks, PCBs, asbestos, and pesticides. There are 60 open Leaking Underground Storage Tank (LUST) sites dispersed throughout the city. There are no identified "brownfield" properties in the city. Reuse and intensified use of former industrial and commercial areas, particularly in Central Petaluma, has the potential to expose one or more hazardous materials during demolition and/or excavation. Remediation of these hazards is necessary before rehabilitation or construction can begin.

Hazardous waste management in Petaluma is administered by the Sonoma County Waste Management Agency (SCWMA) through the Countywide Integrated Waste Management Plan (CoIWMP). As required by State law, this planning document includes the Source Reduction and Recycling Element (SRRE), Household Hazardous Waste Element (HHWE), Non-Disposal Facility Element (NDFE), as well as the Siting Element.

State law requires that communities form a Consolidated Unified Protection Agency (CUPA) to manage the acquisition, maintenance, and control of hazardous waste by industrial and commercial business. In Petaluma, the Fire Marshal's Office administers the CUPA programs. As the CUPA, the Fire Department regulates all aspects of hazardous materials storage, use, and waste disposal. This includes policy, training of personnel, and procedures for processing the various elements of the CUPA program.

There are no hazardous waste disposal sites in the city. Hazardous waste management programs are conducted by the SCWMA. A new Households Toxics Facility recently opened at the Central Landfill, where households and businesses within Sonoma County can drop off hazardous materials. In addition, community toxics collections are conducted in a different city each week by the SCWMA. These services are available to households and businesses that qualify as small-quantity generators (i.e., generate a maximum of 100 kilograms (27 gallons or 220 pounds) or less of hazardous waste per month). Residential pick-up service is available by appointment.

HAZARDOUS MATERIAL EXPOSURE PATHWAYS AND RISK ASSESSMENT

Exposure Pathways

Exposure pathways are the means by which hazardous substances move through the environment from a source to a point of contact with people. A complete exposure pathway must have four parts: (1) a source of contamination, (2) a mechanism for transport of a substance from the source to the air, surface water, groundwater, and/or soil, (3) a point where people come in contact with contaminated air, surface water, groundwater, or soil, and (4) a route of entry into the body. Routes of entry can include eating or drinking contaminated materials, breathing contaminated air, or absorbing contaminants through the skin. Risks can be assessed when an exposure pathway is complete. If any part of an exposure pathway is absent, the pathway is said to be incomplete and no exposure or risk is possible. In some cases, although a pathway is complete, the likelihood that significant exposure will occur is very small.

Exposure pathways can exist under many different circumstances. Toxic substances can be released from a facility or source of contamination during normal, everyday operations or unintentionally through leaks, spills, fires, or other accidents. After release, contaminants can be transported through the environment by various means.

The source of environmental contamination can come from any number of activities or conditions. Some facilities discharge treated or untreated liquid wastes into streams, ponds, or lakes, or into groundwater below the surface. Contaminants can be released directly to the soil and become attached to soil particles or seep into the groundwater. Plants can absorb certain substances directly through their roots from the soil or groundwater, or from groundwater used for irrigation. Runoff from rain and snow can carry contaminants into surface water bodies. Wind can lift contaminated particles from the ground and carry them from one location to another.

The "transport mechanisms" that convey the contaminants from the source to the receptor includes air, water, and soil. In other words, contaminants can travel in a variety of ways from their source of release to locations where people can be exposed. For example, air emissions from an industrial facility's stack might contain contaminants in the form of gases or small particles. These substances can be carried by the wind and eventually deposited onto vegetation, soils, or water surfaces.

Exposure, the third step in a complete pathway, occurs when people breathe contaminants carried in the air (inhalation pathway), eat contaminated fruits or vegetables, or drink contaminated water (ingestion pathway). Accidental ingestion of contaminated soil can also occur when adults and children work or play in contaminated areas. Fish and animals can be exposed in the same ways and, in turn, people might eat fish or meat that contains toxic substances or drink contaminated milk. People can be exposed through external contact, such as swimming or washing in contaminated water (dermal pathway).

Even if a source of contamination exists, human health is not at risk unless exposure is likely to occur. Not all contaminants released to the environment reach points of contact with individuals by all pathways. For example, some chemicals attach or bind tightly to soil particles, which prevent those chemicals from being washed by precipitation into the underlying groundwater. Individuals using groundwater for drinking or other purposes would not be exposed to contaminants via the groundwater. In this case, the groundwater exposure pathway is termed "incomplete," and a risk assessment would conclude that it does not contribute to increased health risks. "Complete" pathways are those by which contaminants have reached or are likely to reach individuals and may therefore adversely affect public health.

Risk Assessment

Risk assessment has been defined as "the characterization of the potential adverse health effects of human exposures to environmental hazard" (National Research Council, 1983). In a risk assessment, the extent to which a group of people has been or may be exposed to a certain chemical is determined, and the extent of exposure is then considered in relation to the kind and degree of hazard posed by the chemical, thereby permitting an estimate to be made of the present or potential health risk to the group of people involved.

Risk assessment information is used in the risk management process in deciding how to protect public health. Examples of risk management actions include deciding how much of a chemical a company may discharge into a river; deciding which substances may be stored at a hazardous waste disposal facility; deciding to what extent a hazardous waste site must be cleaned up; setting permit levels for discharge, storage, or transport; establishing levels for air emissions; and determining allowable levels of contamination in drinking water.

Essentially, risk assessment provides information on the health risk, and risk management is the action taken based on that information. Risk characterization is considered the transitional step to risk management.

A complete risk assessment consists of the following four steps:

1. Hazard identification;
2. Dose-response assessment;
3. Exposure assessment; and
4. Risk characterization.

Hazard identification involves gathering and evaluating data on the types of health injury or disease that may be produced by a chemical and on the conditions of exposure under which injury or disease is produced. It may involve characterization of the behavior of a chemical within the body and the interactions it undergoes with organs, cells, or even parts of cells.

Dose-response assessment involves describing the quantitative relationship between the amount of exposure to a substance and the extent of toxic injury or disease. Data are derived from animal studies or, less frequently, from studies in exposed human populations. There may be many different dose-response relationships for a substance if it produces different toxic effects under different conditions of exposure. The risks of a substance cannot be ascertained with any degree of confidence unless dose-response relations are quantified, even if the substance is known to be toxic.

Exposure assessment involves describing the nature and size of the population exposed to a substance and the magnitude and duration of their exposure. The evaluation could concern past or current exposures, or exposures anticipated in the future.

Risk characterization generally involves the integration of the data and analysis of the first three components of the risk assessment process (hazard identification, dose-response assessment, and exposure assessment) to determine the likelihood that humans will experience any of the various forms of toxicity associated with a substance. In cases where exposure data are not available, hypothetical risk can be characterized by the integration of hazard identification and dose-response evaluation data alone. A framework to define the significance of the risk is developed, and all of the assumptions, uncertainties, and scientific judgments of the preceding three steps are presented.

REGULATORY SETTING

Underground Storage Tanks

Federal laws and regulations relating to underground storage tanks used to store hazardous materials (including petroleum products) require that underground storage tank owners and operators register their tanks with the Environmental Protection Agency (EPA) or delegated agencies. Federal regulations require extensive remodeling and upgrading of underground storage tanks, including installation of leak detection systems. Tank removal and testing procedures are specified by the regulations.

State laws relating to underground storage tanks include permitting, monitoring, closure, and cleanup requirements. Regulations set forth construction and monitoring standards, monitoring standards for existing tanks, release reporting requirements, and closure requirements. Old tanks must eventually be replaced. All new tanks must be double-walled, with an interstitial monitoring device to detect leaks. All soil and groundwater contamination must be cleaned up. The regulations for this program are contained in Chapter 6.7, Division 20 of the Health and Safety Code and Subchapter 16 of Title 23 of the California Code of Regulations, California Underground Storage Tank Regulations, and are implemented by the Regional Water Quality Control Board (RWQCB). Underground storage tank permitting is handled through local governmental agencies. The Sonoma County Environmental Health Division (SCEHD) is the local agency designated to permit and inspect underground storage tanks and to implement related regulations. There are 60 open LUST sites dispersed throughout the City of Petaluma.

Polychlorinated Biphenyls

PCBs are organic oils that were formerly placed in many types of electrical equipment, including transformers and capacitors, primarily as electrical insulators. Years after their widespread and commonplace installation, it was discovered that exposure to PCBs may cause various health effects, and that PCBs are highly persistent in the environment.

In 1979, EPA banned the use of PCBs in most new electrical equipment and began a program to phase out certain existing PCB-containing equipment. The use and management of PCBs in electrical equipment is regulated pursuant to the Toxic Substances Control Act (40 CFR). These regulations generally require labeling and periodic inspection of certain types of PCB equipment and set forth detailed safeguards to be followed in disposal of such items.

Asbestos

Asbestos, a naturally-occurring fibrous material, was used as a fireproofing and insulating agent in building construction before such uses were banned by EPA in the 1970s. Asbestos can cause lung diseases in persons exposed to its airborne fibers. Because it was widely used prior to the discovery of its health effects, asbestos may be found in a variety of building materials and components including walls, ceilings, floors (tile), fireproofing, and pipe insulation.

Federal and State laws and regulations also pertain to building materials containing asbestos. Inhalation of airborne fibers is the primary mode of asbestos entry into the body, making friable (easily crumbled) materials the greatest health threat. For this reason, the substance is regulated both as a hazardous air pollutant under the Clean Air Act and as a potential worker safety hazard under the authority of the Federal Occupational Safety and Health Administration (Fed/OSHA).

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 for release of asbestos fibers; and require notice to federal and local governmental agencies prior to beginning renovation or demolition that could disturb asbestos. In the San Francisco Bay Area, the agencies with primary responsibility for asbestos safety are the Bay Area Air Quality Management District and the California Division of Occupational Safety and Health Administration (Cal/OSHA). Some State regulations on asbestos are more stringent than federal regulations. For example, California requires licensing of contractors who conduct abatement activities.

Pesticides

Pesticides contain chemicals formulated specifically to be toxic to certain living things, which makes them a target for regulation. As the use of modern chemical-based pesticide products has grown, attention has been drawn to their potential adverse side effects. Legislative and regulatory efforts to regulate the use and application of pesticides have sought to retain the benefits while minimizing the potential harm to public health and the environment.

Pesticides are subject to federal and State legislation. Pesticide controls begin with a screening of the toxic ingredients on pesticides to ensure that they do not present undue hazards to human health or non-targeted species. After screening, the use of pesticides is regulated to ensure that workers are trained in proper application techniques, the pesticides are properly handled and stored and the location and content of chemicals is made known to workers, emergency response units, and medical personnel who may be exposed to the chemicals. The resulting array of license, permit, and registration requirements, together with the manifold restrictions on the application, use, and handling of pesticides, reflect a growing desire to evaluate environmental effects accurately and to oversee all pesticide-related activities. Because of the presence in groundwater and surface water and air, pesticides are regulated in California under federal and State water quality laws, safe drinking water laws, and air quality laws.

The following major federal and State statutes and regulations control pesticides:

Federal Insecticide, Fungicide, and Rodenticide Act;

Pesticide Contamination Prevention Act; and

Birth Defects Prevention Act.

Other regulations cover pesticide registration, application, use, permitting, monitoring, storage, transportation and disposal.

Hazardous Waste Disposal

There are no hazardous waste disposal sites within the City of Petaluma. The SCWMA conducted a program where households and small-quantity generators/businesses (i.e., generate a maximum of 100 kilograms [27 gallons or 220 pounds] or less of hazardous waste per month) could drop-off these quantities at designated locations, or have them picked up through the agency-organized Small Business Hazardous Waste Collection Program. A new permanent Hazardous Waste Facility has been constructed at the Central Landfill located between the cities of Cotati and

Petaluma. It is open year-round and replaces the Household Hazardous Waste Roundups and agency-organized Small Business Hazardous Waste Collections.

Certified Unified Program Agency

Since the adoption of the existing 1987 General Plan, the County of Sonoma has implemented several CUPA programs. These programs include the Hazardous Materials Business Plan Program, the Hazardous Waste Program, the Underground Tank Program, the Accidental Release Program, and portions of the Uniform Fire Code, which address hazardous materials. These programs are enforcement and regulatory programs. Inspections of businesses in the County, which are included in any of these programs, are conducted on a routine basis. In addition, the disposal of hazardous waste or hazardous materials is conducted by the SCWMA. The SCWMA has implemented a household and business hazardous waste disposal program. The Petaluma Fire Department is the CUPA agency that regulates these programs within Petaluma, as identified by Chapter 17.21 of the Municipal Code.

Hazardous Materials Management (Business Plan Act)

Under State and federal Community Right-to-Know laws (Section 313 of SARA Title III, as set forth in Title 42 of the U.S. Government Code, Section 11001 et. seq.; 40 CFR parts 300, 350, 355, 370, and 372; Chapter 6.95 of the California Health and Safety Code; and Title 19 of the California Code of Regulations), all businesses which generate, store, handle, or dispose of hazardous materials at designated planning threshold quantities (TQs) must submit to the Sonoma County Department of Emergency Services (SCDES) the following:

> An inventory of all chemicals manufactured, imported, processed, or handled in any other way;
>
> The maximum quantity of the chemical onsite at any one time;
>
> The total quantity of the chemical released during the year, including both accidental and routine emissions;
>
> Off-site locations to which the chemicals were shipped;
>
> Treatment methods for the chemical;
>
> A response and evacuation plan, should an accident occur; and
>
> An employee training plan.

These regulations are intended to provide information to the emergency responders so that they may protect themselves to affect a more efficient response, and to provide public access to information regarding the existence of chemicals in the community.

Risk Management and Prevention Plan

Risk Management and Prevention Plans (RMPPs) must be submitted to the local CUPA. The RMPPs pertain to any industrial, agricultural, and commercial facility that involve the storage, handling, use, and/or disposal of acutely hazardous materials that exceed TQs as per the federal list (Title 40 of the Code of Federal Regulations, Part 68.130). Once submitted, EPA can use the data to measure a facility's on-going compliance success and set further priorities, if necessary.

RMPPs are intended to prevent serious chemical accidents that could affect the environment and/or public health and improve the response to accidents that do occur. The following issues must be addressed and disclosed in a RMPP:

Implementation of safe business practices to identify hazards and manage risks,

Analysis of worst-case releases,

Documentation a five (5) year history of all serious accidents,

Coordination with local emergency responders, and

Proper filing of the RMPP with the local CUPA.

Hazardous Materials Transportation

The U.S. Department of Transportation (DOT) has regulatory responsibility for the safe transportation of hazardous materials. DOT regulations govern all means of transportation, except for those packages shipped by mail, which are covered by U.S. Postal Service regulations. DOT regulations are contained in the Code of Federal Regulations Title 49; Postal Service regulations are in 39 CFR. The State of California has adopted the DOT regulations for the intrastate movement of hazardous materials. State regulations are contained in California Code of Regulations, Title 26.

Under the Resource Conservation and Recovery Act of 1976 (RCRA), the EPA sets standards for transporters of hazardous waste. The State of California regulates the transportation of hazardous waste originating in the State and passing through the State (26 CCR). Both regulatory programs apply in California.

Two State agencies have primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies: the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). The CHP enforces hazardous materials and hazardous waste labeling and packing regulations to prevent leakage and spills of material in transit and to provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans maintains hazardous materials emergency response crews around the State.

Common carriers conduct a large portion of their business in the delivery of hazardous materials. Common carriers are licensed by the CHP, pursuant to the California Vehicle Code, Section 32000. This section requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring transportation placards. The placard (a four-sided, diamond-shaped sign) is displayed on trucks, railroad cars and large containers that are carrying hazardous materials. The placard usually contains a four-digit identification number as well as a class or division number that indicates whether the material is flammable, radioactive, explosive or poisonous.

Every hazardous waste package type used by a hazardous materials shipper must undergo tests that imitate some of the possible rigors of travel. While not every package must be put through

every test, most packages must be able to be (a) kept under running water for a time without leaking; (b) dropped, fully loaded, onto a concrete floor; (c) compressed from both sides for a period of time; (d) subjected to low and high pressure; and (e) frozen and heated alternately. Caltrans and U.S. Postal Service regulations also exist for non-waste hazardous materials, but they are not as stringent as those for hazardous waste.

Hazardous Waste Handling

RCRA created a hazardous waste "cradle-to-grave" regulatory program that is administered by the EPA. Under RCRA, EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. The Hazardous and Solid Waste Act amended RCRA in 1984, affirming and extending the "cradle-to-grave" system of regulating hazardous wastes. The amendments specifically prohibit the use of certain techniques for the disposal of some hazardous wastes.

Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as federal RCRA requirements. EPA must approve state programs intended to implement federal regulations. EPA has approved California's RCRA program. California's Hazardous Waste Control Law is administered by the California Environmental Protection Agency's DTSC. Under the law, California has adopted extensive regulations governing the generation, transportation, and disposal of hazardous wastes. State regulations are generally more stringent than federal RCRA requirements.

The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal and transportation; and identify hazardous wastes that cannot be disposed of in landfills. Hazardous waste manifests must be retained by the generator for a minimum of three years. Hazardous waste manifests list a description of the waste, its intended destination, and regulatory information about the waste. A copy of each manifest must be filed with the State. The generator must match copies of hazardous waste manifests with receipts from treatment, storage, and disposal facilities.

Occupational Safety

Cal/OSHA and Fed/OSHA are the agencies responsible for ensuring worker safety in the handling and use of chemicals in the workplace. Within the State, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations. Cal/OSHA standards are generally more stringent than federal regulations.

Under the authority of the Occupational Safety and Health Act of 1970, Fed/OSHA has adopted numerous regulations pertaining to worker safety (29 CFR). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some Fed/OSHA regulations contain standards relating to hazardous materials handling, including workplace conditions, employee protection requirements, first aid and fire protection, as well as material handling and storage. Because California has a federally-approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR.

Cal/OSHA regulations (8 CCR) concerning the use of hazardous materials in the workplace require employee safety training, safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances, and communicating hazard information relating to hazardous substances and their handling. The hazard communication program also requires that Material Safety Data Sheets (MSDS) be available to employees and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and training in emergency evacuation).

Both federal and State laws include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. The training must address methods of safe handling of hazardous materials, MSDSs, emergency response equipment and supplies, and building emergency response plans and procedures. Chemical safety information must be available. Specifically, more detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eyewashes, must also be kept in accessible places.

Cal/OSHA and Fed/OSHA regulations (29 CFR and 8 CCR) include extensive, detailed requirements for worker protection applicable to any activity that could disturb asbestos-containing materials, including maintenance, renovation, and demolition. These regulations are designed to ensure that persons working near the maintenance, renovation, or demolition activity are not exposed to asbestos.

Hazardous Materials Emergency Response

Pursuant to the Emergency Services Act, California has developed an Emergency Response Plan to coordinate emergency services provided by federal, State, and local governmental agencies and private persons. Response to hazardous materials incidents is one part of this plan. The plan is administered by the California Office of Emergency Services. The Office of Emergency Services coordinates the responses of other agencies, including EPA, the CHP, the Department of Fish and Game, the RWQCB, the Bay Area Air Quality Management District, and the SCDES.

In addition, pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985 (the Business Plan Law), local agencies are required to develop "area plans" for response to releases of hazardous materials and wastes. These emergency response plans depend to a large extent on the Business Plans submitted by persons who handle hazardous materials (see "Hazardous Materials Management Planning"). An area plan must include pre-emergency planning and procedures for emergency response, notification and coordination of affected governmental agencies and responsible parties, training and follow-up.

IMPACT ANALYSIS

Significance Criteria

Impacts of buildout of the proposed General Plan would be significant if it would:

> Create a significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous materials;
>
> Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
>
> Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
>
> Be located on a site which is included on a list of hazardous materials sites (Cortese List) compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment; or
>
> Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

METHODOLOGY & ASSUMPTIONS

To assess the potential for implementation of the proposed General Plan to involve the use, production, or disposal of hazardous materials in a manner that poses substantial hazards to people, or to animal or plant populations, the following analysis considers the pathways through which exposure to hazards could potentially occur, and evaluates the foreseeable controls that would be placed on each of these pathways. Exposure pathways that are sufficiently controlled to pose no substantial hazards would be considered less-than-significant health and safety issues.

As described previously, exposure pathways are means by which hazardous substances move through the environment from a source to a point of contact with people. If any part of an exposure pathway is absent, the pathway is said to be incomplete and no exposure or risk is possible. In some cases, although a pathway is complete, the likelihood that exposure would occur is very small.

SUMMARY OF IMPACTS

There would be no impacts inside the Urban Growth Boundary related to locating development on hazardous material sites or to interference with an emergency response or emergency evacuation plans. Impacts related to routine transport, use, or disposal of hazardous materials; accidental release of hazardous materials; or hazardous emissions or use of hazardous materials in the vicinity of schools; would be less than significant because existing federal, State, and City regulations require that these hazards be investigated during the project planning process and measures to eliminate them be incorporated in the project design prior to completing the project approval process.

Hazardous emissions and handling of hazardous materials associated with buildout of the proposed General Plan would not occur within the vicinity of existing schools. The routine use of

household and commercial hazardous materials could occur in vicinity of schools (and increase with buildout), depending on the final mix of land use designations under the proposed General Plan. A Hazardous Materials Management Plan (HMMPs) would be required for all businesses handling hazardous materials. The minimal level of risk involved in the residential use of household hazardous materials is considered within acceptable limits. Industrial emissions and industrial use of hazardous materials would not occur within one-quarter mile of any school because such facilities would not be permitted inside the ¼-mile radius. Consequently, buildout under the proposed General Plan would not result in the release of emissions and/or the handling of substantial amounts of hazardous materials in the vicinity of existing or proposed schools and implementation of the proposed General Plan would result in no impact.

New development associated with buildout of the proposed General Plan would not be located on hazardous material sites. The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California EPA to develop and update at least annually a Cortese List. The DTSC is responsible for a portion of the information contained in the Cortese List. Land uses and structures for human occupancy are not permitted on un-remediated Cortese List sites. There are no Cortese sites within the Planning Area. Consequently, buildout under the proposed General Plan would not result in new development being located on hazardous materials sites and implementation of the proposed General Plan would result in no impact.

Buildout of the proposed General Plan would not impair implementation of or physically interfere with an adopted emergency response or emergency evacuation plan. One of the major purposes of the proposed General Plan is to maintain and, if possible, improve traffic circulation and the street system. The addition of new development would include the addition of access points to the existing circulation and street system. Additional access points and/or streets in various parts of the City would be required to conform to the circulation efficiency regulations of the City's Municipal Code, which includes requirements for new access points to facilitate emergency response. Consequently, buildout under the proposed General Plan would not result in the reduction of emergency access and implementation of the proposed General Plan would have no impact on emergency services.

The following evaluation illustrates that the design-controllable aspects of transport, use, storage, and disposal of hazardous materials are governed by existing regulations of the United States, the State of California, and the City of Petaluma. These regulations require the control and reduction of any potentially adverse effects related to hazardous materials. Compliance with these regulations is required, not optional. Compliance must be demonstrated by the project sponsor in the project's design before permits for project construction would be issued.

IMPACTS AND MITIGATION MEASURES

Impact 13.3-1 Buildout of the proposed General Plan could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (Less than significant)

Implementation of the proposed General Plan would enable construction activities involving the standard use of fuels and lubricants considered as hazardous materials or hazardous wastes for construction equipment; the transport of building materials (paints, solvents, insulation, etc.) that may be manufactured from substances considered hazardous materials; and the disposal of construction debris that may contain hazardous wastes (asbestos, PCBs, etc.). DOT regulations contained in the Code of Federal Regulations Title 49 (49 CFR) regulate the safe transportation of hazardous materials. Under RCRA, the EPA sets standards for transporters of hazardous waste. CHP enforces hazardous materials and hazardous waste labeling and packing regulations. Caltrans tests hazardous materials containers and maintains hazardous materials emergency response crews around the State.

Use, transportation, and disposal of these materials is typical in construction activities and project sponsors would be required to manage all hazardous materials pursuant to these federal and State regulations as overseen by the Sonoma County's CUPA programs, as described in the setting section. Implementation of these applicable health and safety requirements would minimize any risks from handling these materials, unless they fail to be identified adequately prior to construction.

The construction and occupation of residential developments typically would involve the use of minor quantities of household paints, solvents, oil and grease, and petroleum hydrocarbons similar to those currently in use. Households typically use familiar products, such as motor oil, paint, and bleach. Most of these chemicals would be consumed by use and with adherence to warning labels and storage recommendations from the individual manufacturers; these hazardous materials would not pose any greater risk than at any other residential development. They must be disposed of according to the requirements of the SCWMA. Because the home use of common household hazardous materials typically is considered to pose an acceptable risk, residential uses would not involve the use or production of household hazardous materials in a manner that poses a substantial hazard to people or the environment.

Retail and commercial developments could include suppliers of various home and garden products for public consumption that are classified as hazardous materials handled routinely by households or other businesses. Common hazardous materials include fuels (e.g., propane), paints (both latex and oil-based), solvents (e.g., degreasers, paint thinners, and aerosol propellants), acids and bases (such as many cleaners), disinfectants, metals (e.g., thermometers, batteries), and pesticides. In most circumstances, the potential risks posed by the handling of these materials are limited to the immediate vicinity of the materials and easily controlled.

Commercial products are labeled to inform users of potential risks and to instruct users in appropriate handling procedures. Because of existing occupational safety regulations and requirements regarding the transport, storage, use and disposal of commonly used hazardous materials, the risks would be expected to be minimal. In addition, a Hazardous Materials Management Plan (HMMP) is required to be submitted and approved by the Petaluma Fire Department prior to occupancy of any business handling hazardous materials. The HMMP defines processes by which businesses manage the receipt, use, exposure to, inventory of, and final disposition of all hazardous materials used on site including those used for facility cleaning and maintenance.

For these reasons, buildout under the proposed General Plan would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials and the potential generation of hazards to the public or the environment would be less-than-significant.

Proposed General Plan Policies that Reduce the Impact

10-P-14 Prepare and maintain an inventory of environmentally contaminated sites to educate future landowners about contamination from previous uses. Work directly with landowners in the cleanup of these sites, particularly in areas with redevelopment potential.

The U.S. Environmental Protection Agency (EPA) in 2005 awarded the City of Petaluma two grants to assess potential brownfield properties within the city. In addition, the City has applied to the EPA for a revolving loan fund grant to help developers, non-profits, and the City clean up brownfield sites.

10-P-15 Establish special zoning designations and environmental review processes that limit the location of industry, research, and business facilities using hazardous materials. Require safe distances between these sites and residential areas, groundwater recharge areas (see General Plan Chapter 8: Water Resources), and waterways.

Impact 3.13-2 Buildout of the proposed General Plan could create a significant hazard to the public or the environment through reasonably foreseeable accidental release of hazardous materials into the environment. (Less than significant)

For the reasons described under Impact 3.13-1, regarding the routine, regulated transport, use, or disposal of hazardous materials under buildout of the proposed General Plan, there would be no significant hazard to the public or the environment through reasonably foreseeable accidental release of hazardous materials. The regulations listed above are intended to reduce this risk during the transport, use, or disposal of hazardous materials. Implementation of these applicable health and safety requirements would minimize risks from handling these materials and reduce the possibility of accidental releases. Should a release occur, the Fire Department, Caltrans, the CHP, and the Office of Emergency Services are prepared to respond with tactical equipment to contain the released material.

Therefore, buildout under the proposed General Plan would not result in the release of hazardous materials and/or be expected to pose any risk of accidental release of hazardous substances, resulting in a less-than-significant impact.

4 Impact Overview

This section summarizes significant unavoidable, irreversible, growth-inducing, and cumulative impacts, as required by CEQA Guidelines.

4.1 SIGNIFICANT 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 project. Also, this EIR must discuss why the project is being proposed, not withstanding such impacts. The proposed policies of the General Plan described in Chapter 3, would avoid or eliminate most potentially significant impacts. However, several impacts classified as significant unavoidable have been identified in the issue areas of noise and air quality:

> Implementation of the proposed General Plan would result in significant noise increases at eight roadway segments within the Petaluma UGB; and
>
> Implementation of the proposed General Plan would result in a projected population that would not be consistent with the population projections assumed in the 2005 Bay Area 2005 Ozone Strategy.

No feasible mitigation measures have been identified that would reduce the noise impacts to a level that is less than significant. Noise impacts along specific road segments in the UGB would be caused by increased vehicular traffic on along those roads. In addition, no feasible mitigation measures have been identified for the inconsistency with the Bay Area 2005 Ozone Strategy. There were no alternatives identified that avoid these two significant impacts.

4.2 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 General Plan will increase the demand for public water. The pace of the City of Petaluma'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 SOURCES

New development under the proposed General 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. Both residential and nonresidential development use electricity, natural gas, and petroleum products for power, lighting, heating, and other indoor and

outdoor services, while cars use both oil and gas. Use of these types of energy for new development would result in the overall increased use of nonrenewable energy resources.

CONSTRUCTION-RELATED IMPACTS

Irreversible environmental changes could also occur during the course of constructing development projects made possible by the proposed General Plan. New construction would result in the consumption of building materials, many of which are made from nonrenewable resources. Construction equipment running on fossil fuels would be needed for excavation and the shipping of building materials. Electricity and water would be used during the construction process for a variety of purposes.

4.3 GROWTH-INDUCING IMPACTS

The EIR must examine the potential growth-inducing impacts of the proposed General Plan. More specifically, CEQA Guidelines require that the EIR "discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly" (CEQA Guidelines §15126.2(d)). New employees from commercial and industrial development and new populations from residential development, represent direct forms of growth. This analysis must also consider the removal of obstacles to population growth, such as improvements in the regional transportation system.

The proposed General Plan is a plan to accommodate future projected growth and development in the City of Petaluma. Projected growth is described in Chapter 2, Project Description, and the environmental consequences related to potential growth are fully assessed in Chapter 3, Environmental Setting, Impact Analysis, and Mitigation. While the proposed General Plan will accommodate future growth projections, it does not, in and of itself, serve to induce future growth within the City of Petaluma beyond what is currently projected.

Although this EIR analysis assumes that growth will occur under the proposed General Plan, this assumption is based on historical growth rates, local and regional demand for homes and jobs, and regional growth projections. Land within the current UGB is designated for urban growth, however, the policies of the proposed General Plan do not provide specific stimulus for growth. With or without the proposed General Plan, growth will occur in Petaluma. Furthermore, the Growth Management Element of the proposed General Plan will ensure that growth rates do not exceed growth projections.

Growth-inducing efforts 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 development cycles. Moreover, long-term changes in economic and population growth are often regional in scope; they are not influenced solely by changes or policies in Petaluma. Business trends are influenced by economic conditions throughout the state and country as well as around the world.

Another consideration is that the creation of growth-inducing potential does not automatically lead to growth. Growth occurs through capital investment in new economic opportunities by the private or public sector. These investment patterns reflect, in turn, the desires of investors to mobilize and allocate their resources to development in particular localities and regions. These and other pressures serve to fashion policy. These factors, combined with the regulatory authority of local governments, serve to mediate the growth-inducing potential or pressure created by a proposed plan. Despite these limitations on the analysis, it is still possible to qualitatively assess the general potential growth-inducing impacts of the proposed General Plan.

INCREASE IN REGIONAL HOUSING DEMAND

As the employment base in Sonoma County continues to increase, more people may be drawn to the City of Petaluma. As a result, housing demand may increase in both the City of Petaluma and other adjacent areas. The City's Housing Element, adopted in 2002 and certified by the California Department of Housing and Community Development, includes programs to address regional housing needs of the near term, and subsequent revisions will extend, modify, or add to these programs as needed to continue to respond to the City's "fair share" of regional housing needs, as required by law.

JOBS/HOUSING BALANCE

A city's jobs/employment ratio (jobs to employed residents) would be 1:1 if the number of jobs in the city equaled the number of employed residents. In theory, such a balance would eliminate the need for commuting. More realistically, a balance means that in-commuting and out-commuting are matched, leading to efficient use of the transportation system, particularly during peak hours. The current job/housing ratio in Petaluma is 1.12, which means that the number of jobs in the city exceeds the number of employed residents by about 12 percent. Buildout under the General Plan will add more population than it will jobs, and the jobs/employment balance will decrease to 1.05. The General Plan seeks to improve this balance by providing a diversity of employment opportunities within the city as well as by providing for alternative modes of travel. In addition, the projected growth rate or total growth over the planning period of the General Plan is a lower percentage than historical growth rates. Also, the proposed General Plan would not include any expansion of the UGB area. As a consequence, the General Plan is not expected to have an adverse impact on jobs/housing balance and therefore would not contribute, directly or indirectly, to regional, subregional, or citywide growth inducing impacts. Table 4-1 displays existing and projected jobs per employed residents ratios.

Table 4-1: Jobs per Employed Residents Ratios

	Existing	*Buildout*
Jobs	33,160	46,540
Employed Residents	29,700	44,450
Ratio	1.12	1.05

Assumptions: 5% housing vacancy rate, 2.7 persons per household, household population as 98.6% of total population.

Source: ABAG Projections 2005, California Department of Finance, 2005. Dyett & Bhatia.

4.4 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 em-

ployment projections for the City of Petaluma and other nearby municipalities, including Santa Rosa, Healdsburg, Rohnert Park, and Sebastopol were evaluated.

It is important to note that the proposed General Plan is essentially a set of projects, representing the cumulative development scenario for the reasonably foreseeable future in the City of Petaluma. Therefore, the analysis presented in Chapter 3 represents a cumulative analysis of Petaluma as a whole, over the next 20 years.

Both the air quality and transportation analyses evaluate the future development scenario as a whole, with the proposed General Plan development and transportation system applied to projected future growth in the region. Therefore, for these two issue areas, analysis of the proposed General Plan represents both the project impacts and cumulative effects. As a result of adding the proposed General Plan to the regional land use and transportation baseline, the travel demand, level of service operations and associated air emissions produced for the proposed project conditions is considered identical to the cumulative condition for CEQA purposes.

Land use, cultural resources, visual resources, and public services and utilities would not result in cumulative impacts in the Planning Area.

Other cumulative impacts are described below.

GEOLOGY, SEISMICITY, AND SOILS

Potentially adverse environmental effects associated with seismic hazards, as well as those associated with expansive soils, topographic alteration, and erosion, usually are site-specific and generally do not combine with similar effects that could occur with other projects in the Planning Area. Implementation of the provisions of the City's Building Code, the National Pollution Discharge Elimination System permit requirements, and the General Plan Safety Policies would ensure that potential site-specific geotechnical conditions would be addressed fully in the design of the project and that potential impacts would be maintained at less than significant levels.

Under the cumulative development scenario, soils, geology, and seismicity conditions would be as described in this section of the EIR wherein it is shown that all potentially hazardous geotechnical conditions would be controlled or eliminated through application of the existing State and City regulatory framework. Therefore, implementation of the General Plan would not contribute to adverse soils, geologic, or seismic effects. Consequently, the impacts of project implementation would not be cumulatively considerable.

BIOLOGICAL RESOURCES

As development continues within the City of Petaluma and throughout Sonoma County, native plant and wildlife habitat will be converted to urban environments. Although more mobile species may be able to survive these changes in their environment by moving to new areas, less mobile species would likely be extirpated. With continued conversion of natural habitat to human use, the availability and accessibility of remaining natural habitats in this ecosystem would dwindle and increased competition for resources, displacement of existing plant and animal populations, and introduction of non-native species would reduce carrying capacities. The conversion of plant and wildlife habitat on a regional level could therefore result in a cumulatively significant impact to biological resources.

Implementation of the proposed General Plan could also contribute to a fragmentation and loss of regional biodiversity through the incremental conversion of plant and wildlife habitat (including special-status species) to human use, and thus limit the availability and accessibility of remaining natural habitat. At present, plant and wildlife habitat in the planning area is mostly ur-

ban. However, some locations in the planning area are still undisturbed and provide generally high quality habitat, connected with other natural areas through Petaluma River, Adobe Creek, Willow Brook and other drainage corridors. Therefore, because the planning area is a large area and represents an emerging natural habitat island in an increasingly urbanized area, the proposed project's contribution to the loss of relatively undisturbed plant and wildlife habitat in the region would be considerable.

The proposed project's considerable contribution to the regional loss of wildlife habitat would be somewhat reduced through project design that preserves natural habitat areas to retain wildlife movement corridors. Project-level mitigation would help to reduce cumulative impacts through preservation of valley oak and riparian woodlands, wetlands, and other natural habitats within proposed open space. Policies outlined in Section 3.8, Biological Resources, would ensure the cumulative impact is less than significant.

NOISE

The proposed General Plan analysis in Chapter 3 includes cumulative analysis as it includes all future development that would occur under the Plan. Therefore, the impacts from stationary sources, construction noise, and construction-related groundborne vibration would be the same as with the project. In addition, the traffic used for the noise analysis included a background growth rate for the background traffic that would account for future growth of surrounding areas. Development under the proposed General Plan, in combination with all other development within the surrounding area, would result in a significant permanent increase in the ambient noise level along most roadway segments within the City.

In addition to increased traffic noise within the city, cumulative development would include the proposed Sonoma-Marin Area Rail Transit (SMART) passenger rail service along an existing rail corridor in Sonoma County, which runs through parts of Petaluma including the downtown area. According to the Draft EIR for the SMART rail project, there would be a.m. and p.m. peak rail service (two railcar trains per day) plus one mid-day train, which would result in an increase in the ambient noise levels for residents along the alignment from operational activities including train passby and horn impacts for at-grade crossings. The Draft EIR for the SMART rail project identified severe noise impacts according to FTA standards for 22 residences within Petaluma due to horn operations for at-grade crossings. In addition to the SMART rail service, freight service could re-start on the rail line through Petaluma. It is estimated that these freight trains could generate noise levels of 66 dBA (CNEL) within 100 feet of the railroad tracks, assuming eight train movements per day in directions, three engines, 100 railcars, and an average speed of 40 miles per hour.

Finally, the Petaluma Trolley, which ran from 1904 to 1932, proposes to bring back Heritage Trolley Service along the old Petaluma and Santa Rosa electric rights-of-way from Downtown Petaluma to Corona Road. The tracks would be adjacent to the NWP mainline, with Phase One providing tracks and two stations between Corona Road and the Petaluma River. Trolley service would include weekend and holiday service using original 1904 electric trolleys and it is anticipated that trolley operations would generate noise levels below those generated by U.S. 101 and the NWP railroad. Rail transit noise would cumulate with the traffic noise increases and would result in a significant increase for residents located along the alignment especially in the vicinity of the at-grade crossings. As there is no feasible mitigation for this impact, cumulative impacts from rail and traffic noise would be significant and unavoidable.

HAZARDOUS MATERIALS

Implementation of the proposed General Plan would allow an increase in the number of structures or land uses that could be subject to the hazardous materials regulation.

Potentially adverse environmental effects associated with the transportation, storage, use, and disposal of hazardous materials usually are site-specific in occurrence, although their long-term impacts may be regional in extent. Individual incidents generally do not combine with similar effects that could occur with other projects in the City. Implementation of the provisions of the City's Municipal Code, EPA, DOT, Fed/OSHA, Cal/OSHA, and CUPA permitting processes, and the General Plan policies would ensure that potential hazardous materials conditions would be addressed fully and that impacts would be maintained at less than significant levels.

Under the cumulative development scenario, hazardous materials, including hazardous wastes, conditions would be as described in this section of the EIR wherein it is shown that all potentially hazardous conditions would be controlled or eliminated through application of the existing federal, State, and City regulatory framework. Therefore, implementation of the General Plan would not contribute to risks associated with hazardous materials. Consequently, the impacts of General Plan implementation would not be cumulatively considerable.

These types of impacts are not limited to the Planning Area, but are characteristic of any area that is experiencing population and employment growth.

4.5 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 and were not discussed in detail. With the exception of mineral resources and housing, 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. Mineral resources and housing are not addressed in this EIR because no mineral resources would be affected and neither substantial numbers of existing housing nor people would be displaced as a result of the proposed General Plan.

5 Analysis of Alternatives

CEQA mandates consideration and analysis of alternatives to the proposed project. 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 General 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 proposed project" (CEQA Guidelines §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.

5.1 BACKGROUND OF ALTERNATIVES DEVELOPMENT

A lengthy process took place to develop the proposed General Plan. This process emphasized community needs and values, as developed from a variety of workshops, which gathered comments from Petaluma residents, businesses, property owners, and other stakeholders as well as City officials. Over forty workshops were held with the Planning Commission, City Council and the community between the fall of 2001 through the summer of 2005, and updates were distributed by newspaper inserts, mailings, and on the City's website. After gathering public input and the creation of a report on existing conditions, opportunities, and constraints in Petaluma, possible new plans were developed that were based on the results of the report and public input. These possible new plans were presented in a *Land Use & Mobility Alternatives* report (February 2004).

ALTERNATIVES INITIALLY CONSIDERED

The *Land Use & Mobility Alternatives* report was intended to respond to community concerns regarding traffic circulation, water resources and the economic health of the City. The alternatives were created based on projected market demand for alternative land uses and to the analysis of environmental resources and constraints undertaken early in the General Plan preparation process. The *Land Use & Mobility Alternatives* report was widely distributed and was presented at six workshops with the Planning Commission and two community workshops. Direction from the Planning Commission was forwarded to the City Council who provided direction is the selection of the preferred plan. The report showed generalized depictions of future land use in the Planning Area and the opportunity areas identified in the Existing Conditions, Opportunities and Challenges Report. The Alternatives were further refined during the public review process.

The Alternatives report considered three development emphases that differed in the amount and location of development and the transportation improvements that would be required in these

future development scenarios. The Alternative scenarios also differed in the uses and locations identified for possible urban growth boundary (UGB) expansion areas.

ALTERNATIVE CONSIDERED BUT REJECTED

The EIR alternatives analysis includes most of the substantive proposals for alternatives and concepts for alternative UGBs that emerged during the planning process. One of the initial alternatives was considered would have provided more jobs and housing development than the proposed General Plan. This Alternative, Alternative C in the *Land Use & Mobility Alternatives* report, focused on intensifying neighborhood centers that would be strategically located throughout the City in an effort to meet the basic needs of the neighborhoods. However, this alternative was eliminated from full analysis because it would not have reduced impacts of the proposed project and would, in fact, have the potential to create greater impacts in regard to transportation and circulation as well as air quality and noise.

5.2 DESCRIPTION OF ALTERNATIVES

Three alternatives to the proposed project are described and evaluated in this chapter:

Alternative 1: No Project;

Alternative 2: Arterial Infill Corridor Development Focus; and

Alternative 3: River Corridor Development Focus

The proposed project is described in Chapter 2 of this EIR, which includes the proposed land use map. Consideration of the No Project Alternative is required by CEQA in all EIRs and represents the continuation of the existing 1987 General Plan. The remaining two alternatives consider land use designations in different configurations in the Planning Area and within the UGB expansion areas.

These two alternatives – the Infill and Arterial Corridor Development Focus and the River Corridor Development Focus – were presented in the *Land Use & Mobility Alternatives* report published as part of the General Plan update process in February 2004. These two alternatives present various strategies for responding to community needs and projected market demand for an assortment of land uses. Due to the limited availability of vacant land in Petaluma, these alternatives focus on infill, redevelopment, and use intensification. These two alternatives are carried forward for analysis in this EIR. Based on the response of the community, a Preferred Land Use Plan that incorporated various aspects of each alternative was developed as a basis for further policy development. The proposed 2025 General Plan is based on this concept.

Table 5.2-1 summarizes buildout under the proposed General Plan and each of the alternatives, including the No Project alternative, and also includes a comparison of the ratio of jobs to employed residents.

Table 5.2-1: Buildout Comparison – Proposed Project and Alternatives

	Proposed Project	*Alternative 1 (No Project)*	*Alternative 1 (Infill/Arterial Development Focus)*	*Alternative 3 (River Corridor Development Focus)*
Residential				
Housing Units	27,949	26,560	28,761	29,580
Population	72,707	69,094	75,714	77,870
Non-Residential				
Floor Area[2]	22,983,000	26,067,328	25,593,646	24,848,063
Total Jobs	49,710	46,601	48,100	47,600
Jobs/Housing Balance				
Employed Residents	44,450	42,244	44,300	47,400
Jobs/Employed Residents Ratio	1.12	1.10	1.09	1.01

1. No UGB expansion is proposed.

2. Buildout of the No Project Alternative would result in a higher non-residential square footage than the proposed General Plan and the other alternatives, but fewer jobs, because it assumes a larger amount of industrial development, which has a lower number of employees per square foot than office and commercial uses.

ALTERNATIVE 1: NO PROJECT ALTERNATIVE

CEQA requires that one of the alternatives be a "No Project" alternative. The No Project alternative represents the case in which the proposed project – the 2025 General Plan – is not adopted by the City of Petaluma. In the absence of the proposed project, the existing 1987 General Plan and zoning would continue to guide the City's development. Full buildout of the existing General Plan would include both currently approved projects, plus additional development permitted by the Plan in the future. Under this alternative, new development would be limited to generally vacant, developable sites within the existing Planning Area, consistent with the existing land use designations. This Alternative indicates less population than the proposed project, however, significant population from development of residential projects within the Central Petaluma Specific Plan rather than Mixed Use as originally anticipated could easily increase the buildout potential of this alternative beyond that of the proposed project, which does include the recent trend of residential development within the CPSP. Without the policies contained in the proposed General Plan, potential development constructed under current policies and codes could be more impactful than development reviewed under the proposed policies.

ALTERNATIVE 2: ARTERIAL INFILL CORRIDOR DEVELOPMENT FOCUS

This alternative would intensify uses along the arterial corridors leading to downtown and Central Petaluma through infilling or re-using vacant and underutilized parcels. Mixed uses featuring ground-floor retail and residential and/or commercial uses on upper floors would replace underutilized sites along Washington Street and Petaluma Boulevard North. Regional

commercial uses would be concentrated at the Highway 101 interchanges with Old Redwood Highway, Rainier Avenue, and East Washington Street. In addition, Business Park uses would be increased in existing business park clusters along North McDowell Boulevard and Lakeville Highway and new business parks would be located northwest of the Highway 101/Lakeville Highway interchange.

Residential development under this alternative would include Mixed Medium and High Density Residential uses along Petaluma Boulevard North frontages, while Low Density and Suburban residential uses would be located on vacant sites to the west. The western and southern hills would remain relatively rural in nature, with infill occurring at a maximum of quarter-acre density, and the Urban Separator would be extended to buffer hillside residences at the UGB's edge.

Transportation improvements under this alternative would emphasize cross-town connections. Rainier Avenue would be extended from McDowell Boulevard North to Petaluma Boulevard North with an underpass and full interchange at Highway 101; Petaluma Boulevard North would be expanded to connect with Highway 101 and the river; Caulfield Lane would be expanded across the river to Petaluma Boulevard South to create a cross-town connection for the southern portion of the City; and the northwestern end of Copeland would be extended to curve across the river and connect to Petaluma Boulevard North to offer additional connections across the river within the downtown area.

Transit improvements would include the location of Sonoma Marin Area Rail Transit (SMART) stations at the existing historic depot and Corona Road. Key bus transit transfer stations (Petaluma Transit, Golden Gate Transit, and Sonoma County Transit) would be located at the Highway 101/Rainier Avenue and Highway 101/Lakeville Highway interchanges.

ALTERNATIVE 3: RIVER CORRIDOR DEVELOPMENT FOCUS

This alternative would focus on providing new housing opportunities connected to the Petaluma River corridor. In the design of new housing under this alternative, ample setbacks, in accordance with the Petaluma River Access and Enhancement Plan, would ensure that the River corridor would serve as a recreational amenity, accommodate stormwater flows, and would preserve river habitat. This alternative would emphasize new Medium and High Density residential neighborhood clusters along the river north of West Payran Street and small Medium Density pockets along Petaluma Boulevard North. Regional Commercial uses would be reinforced in the northern section of the river corridor and mixed uses would be located along Petaluma Boulevard North to provide neighborhood retail and services to the residents.

Where development occurs away from the riverfront, new uses would be designed to be compatible with existing uses. Developable parcels adjoining business parks would also be developed as business parks or with supporting activities. Mixed use and Thoroughfare Commercial would line arterial streets, and in downtown, underutilized sites would contain retail, restaurant, entertainment, and/or residential uses. Regional and Neighborhood Commercial would be concentrated at Highway 101 interchanges and a portion of the existing Fairgrounds site would be transitioned to Regional Commercial.

Low density and hillside sites along Petaluma Boulevard North would remain, except where opportunities for small clusters of high density development are available where topography is suitable.

Transportation improvements under this alternative would emphasize cross-town connections. Rainier Avenue would be extended to Petaluma Boulevard North with a highway underpass and an at-grade or elevated railroad crossing. The existing Corona Road overpass would be widened and expanded into a full highway interchange. Caulfield Lane would also be extended to Petaluma Boulevard South, with a new bridge over the river, and the northwest end of Copeland would be extended to curve across the river and connect to Petaluma Boulevard North.

Transit improvements would include SMART stations at the historic depot, and Corona Road at North McDowell Boulevard. Key transit transfer stations would be located at the Highway 101/Lakeville Highway interchange and the new Highway 101/Corona Road interchange with possible park-and-ride for carpools or vanpools at the Lakeville Highway/Frates Road and Highway 101/Lakeville Street intersections.

5.3 COMPARISON OF ALTERNATIVES

This section describes the environmental impacts that may occur under each alternative and compares impacts of the alternatives to the proposed project impacts, in the same resource areas as addressed in Chapter 3.

LAND USE

The alternatives differ in the amount of land dedicated to residential and non-residential uses, as well as in the density and intensity of development. As a result, each alternative would provide a different number of additional housing units and a different amount of additional non-residential floor area, which in turn would result in different levels of population and employment growth. It should be noted that the buildout planning horizon for the existing General Plan—the No Project Alternative—is the year 2005, while the planning horizon for the remaining alternatives is the year 2025.

Estimates of the buildout population for each alternative are based on the total number of housing units that are projected to exist at that time and on the average household size projected by the Association of Bay Area Governments (ABAG). For the purposes of this analysis, an average household size of 2.7 is assumed. Estimates of the buildout employment for each alternative are based on the total amount of non-residential floor area projected to exist at that time and on the typical amount of floor area needed to accommodate each employee by type of activity (office, retail, industrial, etc.). Table 5.2-1 summarizes the buildout estimates of each alternative compared to the proposed General Plan.

The comparison of alternatives with respect to land use is summarized below. None of the alternatives would result in conversion of any amounts of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. None of the alternatives would divide an established community. Like the proposed General Plan, none of the alternatives would result in any significant impacts related to land use.

Proposed General Plan. The proposed 2025 General Plan would result in the addition of approximately 15,600 residents over existing conditions. It would also add 6,126,000 square feet of non-residential floor area and approximately 13,380 employees to the existing conditions.

Alternative 1 (No Project). This alternative, which represents buildout of the existing General Plan, would result in the addition approximately 12,500 residents to existing conditions. It would also add 9,464,000 square feet of non-residential floor area and approximately 9,600 employees to existing conditions.

Alternative 2 (Arterial Infill Corridor Development Focus). This alternative would result in the addition of approximately 19,100 residents to the existing conditions. It would also add 8,990,674 square feet of non-residential floor area and approximately 15,000 employees to existing conditions.

Alternative 3 (River Corridor Development Focus). This alternative would result in the addition of approximately 21,200 residents to the area and would add 8,246,000 square feet of non-residential floor area and approximately 14,440 jobs to the existing conditions.

TRANSPORTATION

The alternatives described and evaluated below include the No Project Alternative (Alternative 1) as well as Alternatives 2 and 3. The analysis of alternatives was conducted using the same methodology as described in Section 3.2.

Transportation Network Assumptions

Network assumptions that are consistent across all alternatives are improvements including:

Modifications to the Washington Street Interchange;

Rainier Avenue Interchange;

Construction of the Southern Crossing extension between Caulfield Lane and Petaluma Boulevard South;

Improvements to Old Redwood Highway at its interchange with U.S. 101;

Extension of Copeland Street to Petaluma Boulevard North;

Caulfield Lane/Payran Street Intersection Improvements; and

Petaluma Boulevard/Magnolia Avenue – Payran Street Intersection.

Network assumptions that differ across alternatives generally relate to:

Corona Road; and

Rainier Avenue.

Traffic Volumes – Daily Trip Comparison

Under existing conditions (based on 2001 base year traffic volume estimates by the traffic model), a total of 402,000 daily trips are generated. Future (year 2025) traffic conditions were forecasted by model "runs" conducted for each of the three alternatives and for the proposed General Plan. A comparison of the differences between traffic generation between the proposed General Plan and alternatives was made.

Table 5.3-1 compares the total daily vehicle trips generated by each alternative. As shown, there is little difference between the proposed General Plan and Alternative 1 (No Project), while Alternatives 2 and 3 allow greater levels of development resulting in about 5% more traffic than the proposed General Plan or Alternative 1 (No Project).

Table 5.3-1: Daily Vehicle Traffic Comparison – Proposed Project and Alternatives

	Proposed General Plan	*Alternative 1 (No Project)*	*Alternative 2 (Infill/Arterial Development Focus)*	*Alternative 3 (River Corridor Development Focus)*
Total Daily Vehicle Trips	566,000	567,000	600,000	596,000
Difference (from proposed General Plan)	---------	+1,000	+34,000	+30,000

Traffic Volumes – Segment Volume Comparison (PM Peak Hour)

Table 5.3-2 compares PM peak hour traffic volumes under the proposed Plan and alternatives for 20 key arterial segments in the City. Although link volumes go up on some links and down on others, traffic volumes on the link segments are generally highest under Alternative 2 and lowest under Alternative 1 (No Project). As noted above, differences in traffic volumes between the proposed Plan and Alternative 1 (No Project) are generally not significant, while Alternatives 2 and 3 would generally result in higher traffic volumes on most segments.

Table 5.3-2: Comparison of PM Peak Hour Traffic Volumes on Selected Roadway Links

	Roadway Link	*Proposed Plan*	*Alternative 1 (No Project)*	*Alternative 2 (Infill/Arterial Development Focus)*	*Alternative 3 (River Corridor Development Focus)*
1	Washington east of U.S. 101	4,000	4,000	4,000	4,200
2	Washington east of Petaluma Blvd	2,700	2,700	3,100	3,200
3	Washington west of U.S. 101	2,500	2,900	4,400	4,700
4	Bodega west of Lohrman	1,700	1,600	1,800	1,700
5	Corona east of U.S. 101	1,600	2,400	1,700	2,500
6	Corona west of U.S. 101	1,600	2,400	1,400	3,100
7	D Street east of Petaluma Blvd	2,000	1,800	2,200	2,100
8	Ely north of Frates	1,800	2,300	2,500	1,900
9	Frates east of Ely	1,200	1,100	400	400
10	Lakeville east of U.S. 101	4,400	4,400	5,200	4,900
11	Lakeville south of Frates	2,400	2,400	2,700	2,500
12	Lakeville south of Washington	1,400	1,100	1,800	1,500
13	Lakeville west of U.S. 101	3,500	3,500	4,100	3,800
14	McDowell north of Lakeville	2,500	2,700	2,700	2,600
15	Old Redwood Hwy east of U.S. 101	4,200	3,500	4,200	3,500
16	Old Redwood Hwy west of U.S. 101	3,000	2,400	2,800	3,300
17	Petaluma Blvd east of Southern Crossing	1,200	1,100	2,400	2,800
18	Petaluma Blvd south of Payran	3,400	3,500	3,900	3,700
19	Rainier between U.S. 101 and McDowell	3,400	3,000	3,900	2,600
20	Rainier between U.S. 101 and Petaluma Blvd	3,100	2,700	3,700	2,700

Source: Fehr & Peers, 2006.

Each of the General Plan alternatives contains significant growth in commercial uses and at least moderate levels of growth in housing. Regional demands for travel on roads such as U.S. 101, Washington Street, Lakeville Highway, Redwood Highway and Adobe Road will continue to grow over the next 20 years. This combination of factors means that Petaluma will experience increased levels of congestion and that it is largely impractical to assume that the City can build sufficient roadway capacity to accommodate demand. This is particularly the case for the roads with a regional function, where the introduction of new capacity would need to be part of a wider system of improvements (for example, widening U.S. 101 through Petaluma, even if practical, would not solve congestion upstream and downstream, so congestion would continue to occur in Petaluma). In other cases, creating more capacity to accommodate regional travel could encourage travel patterns that the City and adjacent areas view as destructive. As an example, improving traffic flow on Adobe Road would result in more travel demand in this corridor, which could negatively impact the Penngrove area.

Generally, the model results show that future congestion would occur in areas where it is already prevalent, but would become more severe. In practical terms, this means that peak hour delays would increase and that the period of congestion would expand. The degree to which congestion would worsen generally ranges from the least amount of traffic increase (under the proposed Plan or Alternative 1) to a greater degree of traffic increase under Alternatives 2 and 3. If Alternative 2 or 3 were adopted, rather than the proposed Plan, additional transportation mitigations (or statements of overriding consideration) would be necessary on key corridors. In addition, potential impacts on U.S. 101 would be more likely to occur under Alternatives 2 or 3.

Conversely, failure to adopt a new General Plan under the "No Project" Alternative (Alternative 1) would not result in a greatly different set of potentially significant transportation issues, compared to the proposed Plan, since many of the land use and transportation measures assumed in the proposed Plan would be likely to proceed, with or without a new General Plan. Such measures include implementation of the land uses and riverfront enhancements contained in the Central Petaluma Specific Plan, and potential transportation improvements including the proposed cross-town connectors (Southern Crossing and Rainier Interchange), SMART corridor passenger rail service, widening of U.S. 101 and adoption of the updated Bicycle and Pedestrian Plan. A key difference between the proposed Plan and Alternative 1 is that the proposed General Plan contains transportation policy initiatives (such as revised level of service standards and the development of "street typologies" as part of the functional "street classification" system) calling for improvement of multi-modal serving facilities that would be unlikely to be adopted without implementation of the proposed General Plan. For this reason, the proposed Plan is environmentally preferred over the No Project alternative from a transportation perspective. The proposed General Plan is the environmentally superior alternative overall, in terms of transportation, because it would result in slightly less adverse transportation impacts than the other alternatives.

PARKS AND RECREATION

Under the No Project alternative, fewer acres of parkland would be developed by buildout of the General Plan because the City's dedication requirement as set forth in the Municipal Code would remain at 3.64 acres per 1,000 residents as opposed to 5 acres per 1,000 residents, which is proposed under the General Plan with site-specific designation to ensure attainment. New parkland under the No Project alternative would include approximately 67 acres of parkland that was part of the 1987 General Plan Parks and Recreation Element, including future phases of Steamer's Landing, the Johnson Property, the RESA site, Holmbert, UoP Property, Dutra Quarry – Lomas, the former Kenilworth site, and the Westridge urban separator ball field (see Chapter 3.3, Parks and Recreation). At approximately 89 acres of new parkland, Alternatives 2 and 3 would include similar park proposals as those in the proposed General Plan. While not included in the parkland standard, all alternatives would include development of two large regional parks the City is planning, including the 1,737-acre Tolay Park and 269-acre Lafferty Ranch. As detailed below, the proposed General Plan is the only scenario in which the city's existing parkland ratio of 5.3 would be maintained. Under the No Project Alternative, the parkland ratio could exceed the City's existing standard of 3.64 acres per 1,000 residents, but would provide fewer acres of parkland than under the proposed General Plan. Alternatives 2 and 3 would fail to meet the parkland standard and would fall well below the existing ratio. Therefore, the proposed General Plan is the environmentally superior alternative in terms of parks and recreation space in the city.

Proposed General Plan. Buildout of the proposed 2025 General Plan would result in a total park need of approximately 80 acres according to the proposed parkland standards. New parkland acreage proposed under the General Plan would total approximately 89 acres, including 66 acres of community parks and 23 acres of neighborhood parks, which would total 389 acres of community and neighborhood parks at General Plan buildout. With a total population of approximately 72,707 residents, the parkland ratio at buildout of the proposed General Plan would be 5.3 acres of parkland per 1,000 residents, thus exceeding the City's standards as well as maintaining the existing ratio of parkland per residents.

Alternative 1 (No Project). This alternative would result in a total parkland need of approximately 341 acres—41 acres above existing conditions. Under the No Project alternative, approximately 67 acres of new parkland would be developed over the next 20 years. Unlike the proposed General Plan, the No Project alternative would not include a proposal to increase the in-lieu fees/dedication requirements or other incentives, such as a transfer of development rights program (TDR) that would increase the City's ability to acquire the land necessary to create new parks. The 1987 General Plan calls for 5 acres per 1000 population; however the Municipal Code identifies 3.64 acre per 1000 as the standard for calculation of requirement dedication and payment of impact fees.

Alternative 2 (Arterial Infill Corridor Development Focus). This alternative would result in a total park need of approximately 395 acres – 95 acres more than existing conditions. A total of approximately 89 acres of parkland would be developed under this alternative, as outlined above. The 389 acres of parkland proposed under this alternative would result in a parkland ratio of approximately 4.7 acres of parkland per 1,000 residents and would not meet the City's General Plan standard of 5 acres of parkland per 1,000 residents.

Alternative 3 (River Corridor Development Focus). This alternative would result in a larger population than the other alternatives and the proposed General Plan. This alternative would require a total park need of approximately 406 acres of parkland – 106 acres over existing conditions. This alternative proposes the same amount of parkland as Alternative 2, i.e., 89 acres, and would result in a parkland ratio of approximately 4.2 acres of parkland per 1,000 residents. Again, this would fall short of the City's proposed General Plan parkland standard of 5.0 acres of parkland per 1,000 residents.

PUBLIC SERVICES

Schools, Police, Fire, and Emergency Response

Population and job growth projected under all alternatives will likely result in an increase in school enrollment numbers as well as an increased need for public safety officers (police officers and fire fighters), facilities, and emergency management. However, specific sites for schools, police and fire facilities were not evaluated as part of the sketch plan process. As determined for the proposed General Plan, additional facilities would not be required for schools, police and fire personnel because the capacity of existing or planned facilities could accommodate the growth. However, the proposed General Plan represents a smaller population than what would occur under Alternatives 2 and 3. As demonstrated below, the alternatives would not likely require additional school facilities and, therefore, would result in similar impacts on schools as the proposed project. However, due to the increased number of personnel required under Alternatives 2 and 3, additional police and fire facilities may be required beyond those already

planned. Regarding public services, the No Project Alternative represents the environmentally superior scenario due to the fact that it would generate less demand for school space and police and fire services.

Proposed General Plan. Overall, at buildout of the proposed General Plan, enrollment in the public elementary schools in Petaluma would decrease from a total existing enrollment of 5,329 students to approximately 5,281 students or a decline of approximately 1 percent. Enrollments within the Old Adobe Union School District and Petaluma City Unified School District would increase and would exceed capacity; however, because adequate capacity exists within the other elementary school districts within Petaluma, capacity limitations would be mitigated through enrollment redistributions, thus avoiding the need for the construction of additional elementary school facilities. Enrollments within the Petaluma Joint Union High School District would decline substantially during the course of the proposed General Plan, from an existing enrollment of 5,663 students to 4,814 by General Plan buildout or a decline of approximately 15 percent. The Petaluma Joint Union High School District would not likely close any existing facilities due to this drop in enrollment because fluctuations in enrollment are common and they anticipate that future enrollment levels would increase again.

With the increased population anticipated under the proposed General Plan, police and fire services would be required to meet General Plan standards of 1.3 police officers per 1,000 residents and 1 firefighter per 1,000 residents. With a proposed population of approximately 72,707 residents, 21 new police officers and 16 new firefighters would be required to maintain General Plan standards. However, because the proposed General Plan does not propose expansion beyond the existing UGB, the existing number of stations and their existing or planned locations are adequate for meeting Petaluma's needs. Expansion or relocation of the police station is now being investigated.

Alternative 1 (No Project). This alternative would result in a projected total enrollment of approximately 5,022 elementary students, less than under the proposed General Plan. Enrollment would be accommodated by the existing elementary school capacity. For this alternative, secondary school enrollments are projected to be approximately 4,578 students, again less than under the proposed General Plan, and would be accommodated by the existing secondary school capacity of 5,791 seats.

With the increased population anticipated under this alternative, police and fire services would be required to meet General Plan standards of 1.3 police officers per 1,000 residents and 1 firefighter per 1,000 residents. With an anticipated population of approximately 69,094 residents, 14 new police officers and 12 new firefighters would be required to maintain General Plan standards. The construction of new facilities would not be required under this alternative.

Alternative 2 (Arterial Infill Corridor Development Focus). This alternative would result in a projected total elementary enrollment of approximately 5,691 students. While this is greater than enrollment projections for the proposed General Plan, this enrollment could still be accommodated by the existing total capacity of 6,215 seats within Petaluma's elementary school districts. For this alternative, secondary school enrollments are

projected to be approximately 5,187 students, more than under the proposed General Plan, but would still be accommodated by the existing secondary school capacity.

With a projected population of approximately 78,346 residents, 26 new police officers and 21 new firefighters would be required to maintain General Plan standards. The expansion or significant modification of existing facilities may be required to accommodate the additional personnel.

Alternative 3 (River Corridor Development Focus). This alternative would result in a projected total elementary enrollment of approximately 6,087, which is more than the other alternatives as well as the proposed General Plan. However, enrollment under Alternative 3 would be accommodated by the existing elementary school capacity. For this alternative, secondary school enrollments are projected to be approximately 5,548 students, more than under the proposed General Plan, but would still be accommodated by the existing secondary school capacity.

With the increased population anticipated under this alternative, police and fire services would be required to meet General Plan standards of 1.3 police officers per 1,000 residents and 1 firefighter per 1,000 residents. With a projected population of approximately 83,792 residents, 33 new police officers and 27 new firefighters would be required to maintain General Plan standards. The expansion of existing facilities is expected to be required to accommodate the additional personnel.

PUBLIC UTILITIES AND ENERGY

Water, wastewater treatment, solid waste disposal, and energy forecasts are based upon anticipated population and job growth. Typically, larger quantities of water and energy are consumed by larger populations and greater number of jobs than by smaller populations with fewer jobs. Likewise, energy expended on transportation is dependent upon vehicle miles traveled within the city. The No Project Alternative is the only alternative that would reduce water and energy consumption and demand on wastewater treatment and solid waste as compared to the proposed Plan. Alternative 2 would result in more demand and Alternative 3 would result in similar demand to the proposed Plan. Therefore, the No Project Alternative is the environmentally superior alternative related to public utilities and energy.

Proposed General Plan. Under the proposed General Plan, water and energy demands would increase and generation of wastewater and solid waste would increase. Water consumption is expected to exceed available supply before the 2025 horizon year of the proposed General Plan. However, the recycled water program would be expanded and future water supply will be met through conservation and groundwater supply. In addition, energy consumption is not expected to increase to levels that would result in the need for additional energy infrastructure facilities. Because the City just completed construction of the Ellis Creek Recycling Facility, wastewater treatment needs will be met through the 2025 and beyond. Likewise, due to the City's aggressive waste diversion program, solid waste generation would not increase to levels that would exceed available disposal capacity.

Alternative 1 (No Project). Alternative 1 would increase development above existing conditions, but would result in less development than the proposed General Plan.

Therefore, demand for water and energy under Alternative 1 would be less than the proposed General Plan; however, this would not reduce any impacts of the proposed General Plan. This alternative, with slightly less new development projected for housing units and jobs, would place less demands on wastewater and solid waste services and facilities than the proposed General Plan.

Alternative 2 (Arterial Infill Corridor Development Focus). Alternative 2 would result in more residential units and non-residential uses than the proposed General Plan. Therefore, Alternative 2 would result in an increased demand for water and energy. With more development proposed for housing units, but fewer jobs, than the proposed General Plan, Alternative 2 would have more impacts on wastewater and solid waste facilities than Alternative 1, but would have similar impacts as the proposed General Plan.

Alternative 3 (River Corridor Development Focus). Alternative 3 would result in more housing units and less non-residential uses than the proposed General Plan and would likely result in water and energy demand levels and wastewater and solid waste generation similar to the proposed General Plan.

HYDROLOGY, WATER QUALITY, AND FLOODING

Because all alternatives would result in an increase in population and development, impacts associated with nonpoint source pollution, increased impervious surfaces, groundwater supply and flooding would be similar under all alternatives as under the proposed General Plan and would require similar mitigation. Therefore, no new impacts related to hydrology, water quality or flooding would occur under any alternative. Because the proposed General Plan contains extensive policies and programs designed to address the impacts of existing conditions and new population and development, the proposed General Plan is the environmentally superior alternative related to hydrology, water quality and flooding.

GEOLOGY, SEISMICITY, AND SOILS

As with the proposed General Plan, any alternative would be regulated by the City's Building Code, the RWQCB's NPDES permitting process, and the State's Seismic Hazards Mapping Act. Required compliance with the provisions of these laws and regulations would have the same effects of reducing or eliminating impacts related to geology, soils, or seismicity as the proposed General Plan. The impact analysis for the proposed General Plan would apply equally to any alternative. Consequently, there would be no new impacts related to geology, soils, or seismicity under any alternative.

BIOLOGICAL RESOURCES

Impacts to biological resources can occur as a result of conversion of existing vegetated land and habitat to built areas that accommodate population and job growth. Expansion of urban areas into natural areas has the potential to result in loss or degradation of habitat for protected species, of wetlands, or of other sensitive habitat. Building activities can result in direct mortality of protected species and temporary loss of wetlands or other habitat. All alternatives would result in similar levels of development inside the UGB, and therefore would impact biological resources within the UGB equally. The preferred plan proposes extensive preservation of biological habitat along the River, reduces the presence of development and associated potential impacts; therefore the proposed project is the environmental superior alternative for biological resources.

Proposed General Plan. Species that could be impacted by proposed development in this area include, but are not limited to: Steelhead, Chinook salmon, Pacific Lamprey, Sacramento Splittail, California Tiger Salamander, Mountain Yellow-legged frog, California Red-legged frog, Western spadefoot toad, Marsh microseris, Point Reyes Checkerbloom, Alkali Milk-Vetch, Franciscan Onion, Petaluma Popcorn Flower, Round-leaved Filaree, Sonoma Spine-flower, Showy Indian clover, and Yellow larkspur. Furthermore, development could also result in impacts on wetlands, riparian habitat, oak woodland or "waters of the US".

Alternative 1 (No Project). In the absence of the proposed project, the existing 1987 General Plan and zoning would continue to guide the City's development. Full buildout of the existing General Plan would include both currently approved projects, plus a limited amount of additional development permitted by the Plan in the future. Under this alternative, new development would be limited to generally vacant, developable sites within the existing Planning Area. Impacts on biological resources from implementation of this alternative would likely be greater in magnitude, but similar in nature to the impacts that could result with implementation of the proposed Plan.

Alternative 2 (Arterial Infill Corridor Development Focus). This alternative would intensify uses along the arterial corridors leading to Downtown and Central Petaluma through infilling or re-using vacant and underutilized parcels. The western and southern hills would remain relatively rural in nature, with infill occurring at a maximum of quarter-acre density, and the Urban Separator would be extended to buffer hillside residences at the UGB's edge. Construction impacts related to specific projects would likely be more concentrated in the urbanized areas of the City under the infill corridor development focus. This alternative would generate higher population numbers and higher non-residential development numbers, which would result in greater impacts than the proposed Plan.

Alternative 3 (River Corridor Development Focus). This alternative would focus on providing new housing opportunities connected to the Petaluma River corridor. This alternative would result in a larger population, with more residential development within direct proximity to the River than the proposed Plan, which could result in greater impacts to biological resources than the proposed Plan. This alternative would also generate higher population numbers and higher non-residential development numbers, which would result in greater impacts than the proposed Plan.

NOISE

The comparison of noise impacts under the alternatives is based on traffic modeling projections since streets and highways are the primary generators of noise in Petaluma. Noise levels will be highest at intersections with high traffic volumes, and alternatives with lower levels of development or development located further from noise corridors would provide the least exposure to high noise levels. None of the alternatives would eliminate the significant noise impacts identified for the proposed General Plan and, therefore, no scenario represents an environmentally superior alternative related to noise.

Proposed General Plan. Due to increased traffic generation, the proposed General Plan would result in significant noise impacts at two locations within the UGB—Ely Boulevard South north of Frates Road and Frates Road east of Ely Boulevard South.

Alternative 1 (No Project). Alternative 1 would increase development above existing conditions, but would result in less development than the proposed General Plan. However, as shown in Table 5.3-3 below, the proposed General Plan would not result in a substantial noise level increase along the selected roadways compared to No Project. Noise levels under the No Project scenario would be less than the proposed General Plan; however, the No Project Alternative would still result in significant impacts when compared to existing conditions in the Planning Area. Therefore, the No Project alternative would not eliminate any significant noise impacts identified for the proposed General Plan.

Alternative 2 (Arterial Infill Corridor Development Focus). Alternative 2 would result in more residential units and non-residential uses than the proposed General Plan. Therefore, Alternative 2 would result in increased traffic generation and increased noise levels along roadways. Alternative 2 would result in significant noise impacts along roadways in the Planning Area similar to the proposed General Plan.

Alternative 3 (River Corridor Development Focus). Alternative 3 would result in more housing units and less non-residential uses than the proposed Plan. Alternative 3 would likely result in traffic generation levels similar to the proposed General Plan, and would result in significant noise impacts along roadways in the Planning Area similar to the proposed General Plan.

Table 5.3-3: Projected Future Noise Levels with and without Project

	dBA CNEL at 100 feet			
Roadway Segment	*Alternative 1 (2025)*	*Proposed General Plan (2025)*	*Total Increase*	*Substantial Increase?*
U.S. 101 mid Petaluma	77.4	77.4	0	No
U.S. 101 north of Petaluma	76.8	76.8	0	No
U.S. 101 south of Petaluma	76.9	76.9	0	No
Bodega west of Lohrman	65.3	65.6	0.3	No
Corona Road east of U.S. 101	64.5	62.5	-2.0	No
Corona Road west of U.S. 101	64.5	62.9	-1.6	No
D Street east of Petaluma Blvd	62.2	62.6	0.4	No
Ely Road north of Frates Road	64.6	64.0	-0.6	No
Frates Road east of Ely Road	62.9	63.4	0.5	No
Lakeville Street east of U.S. 101	66.9	66.8	-0.1	No
Lakeville Street south of Frates Road	66.3	66.4	0.1	No
Lakeville Street south of Washington Street	59.8	60.0	0.2	No
Lakeville Street west of U.S. 101	65.8	65.9	0.1	No
McDowell Blvd north of Lakeville Street	66.8	66.7	-0.1	No
Old Redwood Hwy east of U.S. 101	67.8	68.5	0.7	No
Old Redwood Hwy west of U.S. 101	66.0	67.2	1.2	No
Petaluma Blvd east of Southern Crossing	63.7	63.2	-0.5	No
Petaluma Blvd south of Payran Street	66.0	66.0	0	No
Rainer Extension between U.S. 101 and McDowell Blvd	67.0	67.6	0.6	No
Rainer Extension between U.S. 101 and Petaluma Blvd	66.5	67.1	0.6	No
Washington Street east of U.S. 101	67.0	66.9	-0.1	No
Washington Street east of Petaluma Blvd	65.1	65.0	-0.1	No
Washington Street west of U.S. 101	65.4	64.9	-0.5	No

Source: EIP Associates, 2006.

AIR QUALITY

Air pollutant emissions are a function of human activity and are directly related to population and consequently to Vehicle Miles Traveled (VMT) by the population. Development under all alternatives would result in increases in population and employment and consequently increases in traffic and air pollutant emissions. Like the proposed General Plan, all of the alternatives would result in a significant impact due to projected populations that would exceed the assumptions of the 2005 Ozone Strategy. Because the No Project Alternative would result in the least amount of

development and the smallest population than the other scenarios, it would appear to result in fewer air quality impacts related to traffic and air pollutant emissions. However, the proposed project includes major improvements to transit, bicycle, and pedestrian circulation facilities, thereby reducing the dependency on motor vehicles and the related Vehicle Miles Traveled. The provision of Mixed Use land use designations in direct proximity to existing and planned residential development affords the opportunity to further reduce vehicle use by encouraging access to services by pedestrian and bicycle use. Therefore, the No Project Alternative represents the environmentally superior alternative for air quality.

Proposed General Plan. The proposed General Plan would not contribute significantly to existing air quality violations and would not place sensitive receptors in proximity to potential sources of objectionable odors, dust, or toxic air contaminants. The proposed General Plan would result in a significant and unavoidable impact due to a projected population that exceeds the populations projected in the 2005 Ozone Strategy and thus is inconsistent with an existing regional air quality plan.

Alternative 1 (No Project). Alternative 1 would increase development above existing conditions, but would result in less development than the proposed General Plan. Therefore, contributions to air quality violations under Alternative 1 would be less than the proposed General Plan; and the impacts would be less than significant, similar to the proposed project. The No Project alternative would result in 2025 population of 69,100, assuming no additional General Plan amendments increasing density or intensity are granted. The 2025 population of 69,100 would be inconsistent with the assumptions of the 2005 Ozone Strategy and would result in a significant and unavoidable impact, similar to the proposed General Plan without the benefit of new policies with the potential to reduce this impact.

Alternative 2 (Arterial Infill Corridor Development Focus). Alternative 2 would result in more residential units and non-residential uses than the proposed General Plan. Therefore, Alternative 2 would result in increased traffic generation and an increase in stationary sources compared to the proposed General Plan. Alternative 2 would also be inconsistent with the 2005 Ozone Strategy. Therefore, Alternative 2 would result in significant and unavoidable air quality impacts similar to the proposed General Plan.

Alternative 3 (River Corridor Development Focus). Alternative 3 would result in more housing units and less non-residential uses than the proposed plan. Alternative 3 would likely result in traffic generation levels in excess of the proposed General Plan and would also be inconsistent with the 2005 Ozone Strategy and would result in significant and unavoidable air quality impacts similar to the proposed General Plan.

VISUAL RESOURCES

Differences in impacts on visual resources relate primarily to the level and geographic extent of development under each of the alternatives and secondarily to the streetscape character. Overall, the proposed General Plan represents the environmentally superior scenario because it would have fewer impacts on the surrounding open space and views of the surrounding hillsides and ridgelines.

Proposed General Plan. The proposed General Plan would not result in any significant impacts on visual resources. The proposed Plan includes policies to ensure that infill

development near the river and in the central areas of Petaluma respect the surrounding character are consistent with the policies established in the River Access and Enhancement Plan and the Central Petaluma Specific Plan. In addition, the proposed General Plan restricts development in the hillside areas to rural, very low and low density residential and does not propose any development outside of the UGB.

Alternative 1 (No Project). Alternative 1 would have more non-residential development than the proposed General Plan. However, the existing General Plan does contain policies aimed at protecting the ridgeline and hillside view corridors surrounding the city. In addition, the River Access and Enhancement Plan would be implemented under the existing General Plan. Therefore, the No Project alternative would not likely result in any additional significant impacts on visual resources along the River. This alternative, without the additional hillside/ridgelines policies contained in the proposed project, could decrease the amount of open space and may result in obstruction of views of hillsides and ridgelines surrounding the city.

Alternative 2 (Arterial Infill Corridor Development Focus). Alternative 2 would result in slightly more development than the proposed General Plan, but like the proposed General Plan, this development would be concentrated on infill development along the City's major arterials and would maintain fairly low-density residential land use designations on the hillsides surrounding the city. This alternative, without the additional hillside/ridgelines policies contained in the proposed project, could decrease the amount of open space and may result in obstruction of views of hillsides and ridgelines surrounding the city.

Alternative 3. (River Corridor Focus) Alternative 3 would include development of medium and high density residential neighborhoods clustered along the river. The clustered neighborhoods along the river would be required to comply with the design guidelines established in the River Access and Enhancement Plan, and therefore, would not result in any significant visual resource impacts on the river. However, the development permitted along the western edge of the City would decrease the amount of open space surrounding the city and could result in the obstruction of some of the viewsheds of the surrounding hillsides and ridgelines.

CULTURAL RESOURCES

Areas of historical, cultural, and paleontological significance are present throughout the Petaluma UGB and the possibility of identifying Native American and/or historic cultural resources is high. Recorded archaeological sites are protected from development, and State laws exist to protect new sites that may be discovered. Development in both rural and built up areas could result in the discovery or disturbance of significant historical, cultural, and paleontological resources.

The comparison of cultural impacts by alternatives is based on the degree and location of new development projected within each alternative. New development on currently undeveloped land as well as development along the river increases the potential to uncover Native American sites. Since historical and archaeological resources are protected by existing national, state and local laws, proposed development would not significantly threaten known sites.

However, future development could potentially lead to the disruption of undiscovered archeological resources as well as potentially threaten historical structures that have not yet been

deemed eligible for the National Register of Historic Places, but are sites of local historical importance. Accordingly, alternatives with the highest degree of infill projects in downtown have the highest potential to impact sites of local historical importance. Similarly, alternatives with the highest degree of new development proposed in undeveloped areas have the greatest potential to disrupt undiscovered archeological resources. The proposed General Plan represents the environmentally superior alternative related to cultural resources because it would pose less threat to undiscovered archaeological resources in undeveloped areas and contains policies designed to protect existing archaeological and historic resources.

Proposed General Plan. Under the proposed General Plan, new development has the potential to disrupt archaeological resources on previously undeveloped land due to the prevalence of archaeological deposits that have been recorded in the area. In addition, due to the potential for increased infill development in downtown Petaluma under the proposed General Plan, increased impacts to sites of local historic importance or to the overall historic setting of downtown could occur. However, the proposed General Plan would contain policies to ensure the protection of undiscovered archaeologically resources as well as historic sites and settings in the downtown area and would focus development in previously disturbed infill and underutilized sites.

Alternative 1 (No Project). The No Project would result in a greater amount of non-residential development than the proposed project, which could pose a greater threat to archaeological resources. The 1987 General Plan contains fewer policies protecting historic resources than the proposed General Plan; therefore, historic resources, particularly those in the downtown area, would have more protection under the proposed General Plan than under the No Project alternative.

Alternative 2 (Arterial Infill Corridor Development Focus). This alternative would result in slightly more development than under the proposed General Plan due to a higher population and more non-residential development. Overall, this alternative would pose a larger threat to archaeological resources than the proposed General Plan. Historic resources would have similar protection under this alternative as they would under the proposed General Plan and the No Project alternative.

Alternative 3 (River Corridor Development Focus). This alternative would result in less non-residential development than the proposed project, but more housing units. Overall, this alternative would result in a similar amount of development as the proposed project and, therefore, could have a similar impact on archaeological resources within the UGB. Like the proposed Plan, this alternative would include similar policies to ensure the protection of historic structures within Petaluma.

HAZARDOUS MATERIALS

As with the proposed General Plan, any alternative plan would be regulated by the City's Municipal Code, Environmental Protection Agency, Department of Transportation, Federal Occupational Safety and Health Administration (OSHA), California OSHA, and Consolidated Unified Protection Agency permitting processes. Required compliance with the provisions of these laws and regulations would have the same effects of reducing or eliminating impacts related to hazardous materials, including hazardous wastes, as the proposed General Plan. The impact analysis for the proposed General Plan would apply equally to any alternative. Consequently, there would be no new impacts related to hazardous materials under any alternative.

5.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines require identification of an environmentally superior alternative. Based on the analysis in Section 5.3, the proposed General Plan is considered to be the environmentally superior alternative. The proposed General Plan would result in fewer biology, cultural, and visual impacts. In addition, because the proposed General Plan projects a greater amount of new parkland than the No Project Alternative, but a smaller population than Alternatives 2 and 3, the proposed Plan would have fewer impacts on parks and recreation. Regarding transportation, the proposed Plan would represent the environmentally superior alternative because it would result in slightly fewer impacts due to the policies that would be adopted to address the increasing demand on the transportation infrastructure. However, because overall development under the alternatives would be similar to the proposed General Plan, impacts in areas such as land use, hydrology, geology, and hazardous materials would be the same. While the No Project scenario would be the environmentally superior alternative for areas such as public services, public utilities and air quality because the smaller population would result in less demand on services and utilities and less effect on air quality, the proposed General Plan is the environmentally superior alternative in a greater number of issue areas.

6 Report Authors

This Draft EIR has been prepared by:

THE CITY OF PETALUMA

City of Petaluma
Department of General Plan Administration
27 Howard Street
Petaluma, CA 94952

Pamela Tuft, AICP, Director
Scott Duiven, Senior Planner

General Plan Executive Team (City manager, Community Development, Fire, GIS, Parks & Recreation, Police, Public Facilities, and Water Resources)

CONSULTING TEAM

Dyett & Bhatia, Urban and Regional Planners

Rajeev Bhatia, AICP, ASLA, Principal-in-Charge
Vicki Hill, Associate Principal
Kelly Ross, AICP, Senior Planner (Land Use, Parks and Recreation, Public Services, Cultural Resources)
Ofelia Rodriguez, Planner and Urban Designer (Project Description, Visual Resources)
Kirsten Lawrence, GIS Specialist
Mark Chambers, Graphics Manager

EIP Associates

John Steere, Project Manager
Melissa Duncan, Associate Manager (Deputy Project Manager, Energy)
Natalie Irwin, Associate Scientist (Noise, Air Quality)
Russell Kobayashi, Associate Biologist (Biological Resources)
George Burwasser, Senior Scientist (Geology, Hazardous Materials)

Fehr & Peers

Colin Burgett, AICP, Transportation Planner
Phyllis Chan, Senior Engineering Technician
Matt Haynes, P.E., Transportation Engineer
Matthew Ridgway, AICP, Principal
Thomas Tumola, Transportation Engineer

7 Persons and Organizations Consulted

This following have been consulted in the preparation of the Draft EIR:

THE CITY OF PETALUMA

Pamela Tuft, AICP, General Plan Administration Director
Scott Duiven, Senior Planner

Jim Carr, Director, Parks and Recreation Department
Petaluma Police Department
Cinnabar School District
Old Adobe School District
Petaluma City School District
Waugh School District
Petaluma Joint High School District

SONOMA COUNTY

Steven Mason, Senior Geographic Information Technician, Permit and Resource Management Department

ASSOCIATION OF BAY AREA GOVERNMENTS

Jerry Lahr, Power Pool Project Manager

PACIFIC GAS AND ELECTRIC COMPANY

Jack Rust, Supervisor, Land Services North Coast Area

CONSULTING TEAM

Dyett & Bhatia, Urban and Regional Planners

Rajeev Bhatia, AICP, ASLA, Principal-in-Charge
Kelly Ross, AICP, Senior Planner
Ofelia Rodriguez, Planner and Urban Designer
Kirsten Lawrence, GIS Specialist
Mark Chambers, Graphics Manager

EIP Associates

John Steere, Project Manager
Melissa Duncan, Associate Manager
Natalie Irwin, Associate Scientist
Russell Kobayashi, Associate Biologist
George Burwasser, Senior Scientist

Fehr & Peers

Colin Burgett, AICP, Transportation Planner
Phyllis Chan, Senior Engineering Technician
Matt Haynes, P.E., Transportation Engineer
Matthew Ridgway, AICP, Principal
Thomas Tumola, Transportation Engineer

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Glossary

ADT. Average daily traffic.

Agriculture. Use of land for the production of food and fiber, including the growing of crops and/or the grazing of animals on natural prime or improved pastureland.

Air Pollution. Concentrations of substances found in the atmosphere that exceed naturally occurring quantities and are undesirable or harmful in some way.

Alquist-Priolo Earthquake Fault Zone. In 1972 the State of California began delineating special studies zones (called Earthquake Fault Zones since January 1994) around active and potentially active faults in the State. The zones are revised periodically, and extend 200 to 500 feet on either side of identified fault traces. No structures for human occupancy may be built across an identified active fault trace. An area of 50 feet on either side of an active fault trace is assumed to be underlain by the fault, unless proven otherwise. Proposed construction in the Earthquake Fault Zone is permitted only following the completion of a fault location report prepared by a California Registered Geologist.

Ambient. Surrounding on all sides; used to describe measurements of existing conditions with respect to traffic, noise, air and other environments.

Annex, v. To incorporate a land area into an existing district or municipality, with a resulting change in the boundaries of the annexing jurisdiction.

Apartment. (1) One or more rooms of a building used as a place to live, in a building containing at least one other unit used for the same purpose. (2) A separate suite, not owner occupied, which includes kitchen facilities and is designed for and rented as the home, residence, or sleeping place of one or more persons living as a single housekeeping unit.

Approach Zone. The air space at each end of a landing strip that defines the glide path or approach path of an aircraft and that should be free from obstruction.

Aquifer. A natural underground formation that is saturated with water, and from which water can be withdrawn.

Archaeological. Relating to the material remains of past human life, culture, or activities.

Arterial. A street whose primary function is to carry high-speed through-traffic in a continuous route across an area. A vehicular right-of-way whose primary function is to carry through traffic in a continuous route across an urban area while also providing some access to abutting land. Major arterials are typically divided (have raised medians), have more travel lanes, and carry more traffic than minor arterials.

Attainment Area. An area determined to have met federal or State air quality standards, as defined in the federal Clean Air Act or the California Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

Auto-oriented Uses. Land uses designed to accommodate customers who use autos to travel to the site, including automobile sales and service, building supplies and materials and drive-up or drive-through uses.

Bike Paths (Class I facilities). Paved facilities that are physically separated from roadways used by motor vehicles by space or a physical barrier and are designated for bicycle use.

Bike Lanes (Class II facilities). Lanes on the outside edge of roadways reserved for the exclusive use of bicycles, so designated with special signing and pavement markings.

Bike Routes (Class III facilities). Roadways are roadways recommended for use by bicycles and often connect roadways with bike lanes and bike paths. Bike routes are designated with signs.

Building. Any structure used or intended for supporting or sheltering any use or occupancy.

Building Height. The vertical distance from the average contact ground level of a building to the highest point of the coping of a flat roof or to the deck line of a mansard roof or to the mean height level between eaves and ridge for a gable, hip, or gambrel roof. The exact definition varies by community. For example, in some communities building height is measured to the highest point of the roof, not including elevator and cooling towers.

Buildout. That level of development characterized by full occupancy of all developable sites in accordance with the General Plan; the maximum probable level of development envisioned by the General Plan under specified assumptions about densities and intensities. Buildout does not necessarily assume parcels are developed at maximum allowable intensities.

California Environmental Quality Act (CEQA). A State law requiring State and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an Environmental Impact Report (EIR) must be prepared and certified as to its adequacy before taking action on the proposed project. General Plans require the preparation of a "program EIR."

Caltrans. California Department of Transportation.

Carbon Monoxide (CO). A colorless, odorless gas formed by the incomplete combustion of fuels, which is toxic because of its tendency to reduce the oxygen-carrying capacity of the blood.

Characteristic Earthquake. Characteristic earthquakes are repeat earthquakes that have the same faulting mechanism, magnitude, rupture length, location, and, in some cases, the same epicenter and direction of rupture propagation as earlier shocks. As used in this report, the moment magnitude (M_W) of the "characteristic earthquake" indicates the scale of the seismic event considered representative of a particular fault segment, based on seismologic observations and statistical analysis of the probability that a larger earthquake would not be generated during a given time frame (often 50 or 100 years). In the Bay Area, the characteristic earthquake for the Peninsula segment of the San Andreas Fault has a moment magnitude (M_W) of 7.3; the Northern and Southern segments of the Hayward fault, a MW of 6.9; and the Calaveras fault, M_W 6.2. The term "characteristic earthquake" replaces the term "maximum credible earthquake" as a more reliable descriptor of future fault activity (Working Group on California Earthquake Probabilities, 2003).

Clustered Development. Development in which a number of dwelling units are placed in closer proximity than usual, or are attached, with the purpose of retaining an open space area.

Collectors. Streets designed to move traffic between local streets and the arterial street system, and to handle trips within or between neighborhoods. Collector streets are typically considered local type streets. Residential collector street volumes should not exceed 3,000 vehicles per day. Collectors typically have two lanes, with curb parking allowed, and traffic signals and turning lanes at major intersections. Not all collectors are shown on the General Plan Diagram.

Commercial. A land use classification that permits facilities for the buying and selling of commodities and services.

Community Noise Equivalent Level (CNEL). A 24-hour energy equivalent level derit prove catastrophic.

Community Park. Land with full public access intended to provide recreation opportunities beyond those supplied by neighborhood parks. Community parks are larger in scale than neighborhood parks but smaller than regional parks.

Community Separator. Largely open, natural areas with low intensity development between cities and communities in Sonoma County.

Compatible. Capable of existing together without conflict or ill effects.

Condominium. A structure of two or more units, the interior spaces of which are individually owned; the balance of the property (both land and building) is owned in common by the owners of the individual units.

Conservation. The management of natural resources to prevent waste, destruction, or neglect. The state mandates that a Conservation Element be included in the general plan.

Consistent. Free from variation or contradiction. Programs in the General Plan are to be consistent, not contradictory or preferential. State law requires consistency between a general plan and implementation measures such as the zoning ordinance.

Creek. Natural or once natural flowing waterway. Some creeks are channelized and used as drainage systems.

Day-Night Average Sound Level (Ldn). The A-weighted average sound level in decibels during a 24-hour period with a 10 dB weighing applied to nighttime sound levels (10 p.m. to 7 a.m.). This exposure method is similar to the CNEL, but deletes the additional weight given in that measurement to noise during the evening time period (7 p.m. to 10 p.m.).

Decibel (dB). A unit used to express the relative intensity of a sound as it is heard by the human ear. The decibel measuring scale is logarithmic. Zero (0 dB) on the scale is the lowest sound level that a normal ear can detect under very quiet ("laboratory") conditions and is referred to as the "threshold" of human hearing. On the logarithmic scale, 10 decibels are 10 times more intense, 20 decibels are 100 times more intense, and 30 decibels are 1,000 times more intense than 1 decibel.

Decibel "A-Weighted" (dBA). The scale for measuring sound in decibels that weights or reduces the effects of low and high frequencies in order to simulate human hearing. See also Decibel.

Dedication. The turning over by an owner or developer of private land for public use, and the acceptance of land for such use by the governmental agency having jurisdiction over the public function for which it will be used. Dedications for roads; parks, school sites, or other public uses often are made conditions for approval of a development by a city or county.

Dedication, In lieu of. Cash payments that may be required of an owner or developer as a substitute for a dedication of land, usually calculated in dollars per lot, and referred to as in lieu fees or in lieu contributions.

Density, Gross. The number of dwelling units per gross acre of developable residential land designated on the General Plan Diagram.

Design Capacity. The capacity at which a street, water distribution pipe, pump or reservoir, or a wastewater pipe or treatment plant is intended to operate.

Development Fees. Direct charges or dedications collected on a one-time basis for a service provided or as a condition of approval being granted by the local government.

DOF. California Department of Finance.

Easement. A right given by the owner of land to another party for specific limited use of that land. An easement may be acquired by a government through dedication when the purchase of an entire interest in the property may be too expensive or unnecessary.

EMF. Electric and magnetic field.

Emission Factor. The rate at which pollutants are emitted into the atmosphere by one source or a combination of sources.

Endangered Species, California. A native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant, which is in serious danger of becoming extinct throughout all or a significant portion of its range, due to one or more factors, including loss in habitat, change in habitat, over-exploitation, predation, competition, or disease. The status is determined by the State Department of Fish and Game together with the State Fish and Game Commission.

Endangered Species, Federal. A species which is in danger of extinction throughout all or a significant portion of its range, other than the species of the Class Insect determined to constitute a pest whose protection under the provisions of the 1973 Endangered Species Act, as amended, would present an overwhelming and overriding risk to humans. The status is determined by the US Fish and Wildlife Service and the Department of the Interior.

Environment. The physical conditions in an area, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance, which will be affected by a proposed project. The area involved shall be the area in which significant effects would occur either directly or indirectly as a result of the project. The "environment" includes both natural and man-made conditions.

Environmental Impact Report (EIR). A document used to evaluate the potential environmental impacts of a project, evaluate reasonable alternatives to the project, and identify mitigation measures necessary to minimize the impacts. The California Environmental Quality Act (CEQA) requires that the agency with primary responsibility over the approval of a project (the lead agency) evaluate the project's potential impacts in an Environmental Impact Report (EIR).

Environmental Setting. The physical conditions in an area, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance, which will be affected by a proposed project. The area involved shall be the area in which significant effects would occur either directly or indirectly as a result of the project. The "environment" includes both natural and man-made conditions.

EPA. Environmental Protection Agency.

Equivalent Noise Level (Leq). A single-number representation of the fluctuating sound level in decibels over a specified period of time. It is a sound-energy average of the fluctuating level.

Erosion. The process by which material is removed from the earth's surface (including weathering, dissolution, abrasion, and transportation), most commonly by wind or water.

Family. (1) Two or more persons related by birth, marriage, or adoption [U.S. Bureau of the Census]. (2) An individual or a group of persons living together who constitute a bona fide single-family housekeeping unit in a dwelling unit, not including a fraternity, sorority, club, or other group of persons occupying a hotel, lodging house or institution of any kind [California].

Fault. A fracture in the earth's crust forming a boundary between rock masses that have shifted.

Fire Hazard Zone. An area where, due to slope, fuel, weather, or other fire-related conditions, the potential loss of life and property from a fire necessitates special fire protection measures and planning before development occurs.

FIRM. Flood Insurance Rate Map.

Flood Plain. The relatively level land area on either side of the banks of a stream regularly subject to flooding. That part of the flood plain subject to a one percent chance of flooding in any given year is designated as an "area of special flood hazard" by the Federal Insurance Administration.

Floor Area, Gross. The total horizontal area in square feet of all floors within the exterior walls of a building, but not including the area of unroofed inner courts or shaft enclosures.

GIS, Geographic Information System. A computer-based database to organize spatial information.

Ground Acceleration. The speed at which soil or rock materials are displaced by seismic waves. It is measured as a percentage of the acceleration of gravity (0.5g = 50 percent of 32 feet per second squared, expressed as a vertical or horizontal force). Peak ground acceleration is the maximum acceleration expected from the characteristic earthquake predicted to affect a given area. Repeatable acceleration refers to the acceleration resulting from multiple seismic shocks. Sustained acceleration refers to the acceleration produced by continuous seismic shaking from a single, long-duration event.

Habitat. The natural environment of a plant or animal.

Hazardous Material. A material or form of energy that could cause injury or illness to persons, livestock, or the natural environment.

Hazardous Waste. Waste which requires special handling to avoid illness or injury to persons or damage to property. Includes, but is not limited to, inorganic mineral acids of sulfur, fluorine, chlorine, nitrogen, chromium, phosphorous, selenium and arsenic and their common salts; lead, nickel, and mercury and their inorganic salts or metallo-organic derivatives; coal, tar acids such as phenol and cresols and their salts; and all radioactive materials.

Historic; Historical. An historic building or site is one that is noteworthy for its significance in local, state, or national history or culture, its architecture or design, or its works of art, memorabilia, or artifacts.

Historic Preservation. The preservation of historically significant structures and neighborhoods until such time as, and in order to facilitate, restoration and rehabilitation of the building(s) to a former condition.

Household. Person or persons living in one housing unit.

Housing Unit, Multifamily. Units with two or more housing units in one structure sharing a common floor/ceiling.

Housing Unit, Single-Family Attached. Single-family units that are attached to other units with adjoining walls extending from ground to roof that separate it from other adjoining structures and form a property line. Each unit has its own heating system.

Housing Unit, Single-Family Detached. Single-family units that are detached from any other house with open space on all four sides.

Impact. The effect of any direct man-made actions or indirect repercussions of man-made actions on existing physical, social, or economic conditions.

Impact Fee. A fee, also called a development fee, levied on the developer of a project by a city, county, or other public agency as compensation for otherwise-unmitigated impacts the project will produce. California Government Code Section 66000 *et seq* specifies that development fees shall not exceed the estimated reasonable cost *of* providing the service for which the fee is charged. To lawfully impose a development fee, the public agency must verify its method of calculation and document proper restrictions on use of the fund.

Impervious Surface. Any material which reduces or prevents absorption of water into land.

Industrial. The manufacture, production, and processing of consumer goods. Industrial is often divided into "heavy industrial" uses, such as construction yards, quarrying, and factories; and "light industrial" uses, such as research and development and less intensive warehousing and manufacturing.

Infill. The development of new housing or other buildings on scattered vacant lots in a built-up area or on new building parcels created by permitted lot splits.

Infrastructure. Permanent utility installations, including roads, water supply lines, sewage collection pipes, and power and communications lines.

Intersection Capacity. The maximum number of vehicles that has a reasonable expectation of passing through an intersection in one direction during a given time period under prevailing roadway and traffic conditions.

Jobs-Employed Residents' Balance. Total jobs divided by total employed residents (i.e. people who live in the area, but may work anywhere). A ratio of 1.0 indicates a balance. A ratio greater than 1.0 indicates a net in-commute; less than 1.0 indicates a net out-commute.

Jobs-Housing Balance. Total jobs divided by total housing units. A more appropriate measure is the jobs/employed residents' ratio.

Land Use. The purpose or activity for which a piece of land or its buildings is designed, arranged, or intended, or for which it is occupied or maintained.

Landmark. Refers to a building, site, object, structure, or significant tree, having historical, architectural, social, or cultural significance and marked for preservation by the local, state, or federal government.

Landscaping. Planting-including trees, shrubs, and ground covers-suitably designed, selected, installed, and maintained as to enhance a site or roadway permanently.

Landslide. A general term for a falling mass of soil or rocks.

Less than Significant Impact. An impact that would not result in a substantial and adverse change in the environment and would not require mitigation.

Level of Service (LOS). A quantitative measure of the effect of traffic flow factors such as special travel time, interruptions, freedom to maneuver, driver comfort, and convenience, and indirectly, safety and operating cost. Levels of service are usually described by a letter rating system of A through F, with LOS A indicating stable traffic flow with little or no delays and LOS F indicating excessive delays and jammed traffic conditions.

Liquefaction. A sudden large decrease in the shearing resistance of cohesion less soil, caused by a collapse of the structure by shock or strain, and associated with a sudden but temporary increase of the pore fluid pressure.

Maximum Credible Earthquake (MCE). The largest Richter magnitude (M) seismic event that appears to be reasonably capable of occurring under the conditions of the presently known geological framework. This term has been replaced by "characteristic earthquake," which is considered a better indicator of probable seismic activity on a given fault segment in a specific time frame.

Mitigation. A specific action taken to reduce environmental impacts. Mitigation measures are required as a component of an environmental impact report (EIR) if significant impacts are identified.

Mitigation Measure. Action taken to reduce or eliminate environmental impacts. Mitigation includes: avoiding the impact altogether by not taking a certain action or parts of an action; minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments.

Mobile Home. A structure, transportable in one or more sections which is built on a permanent chassis and designed to be used as a dwelling unit, with or without a permanent foundation when connected to the required utilities.

Modified Mercalli Intensity (MMI) Scale. A 12-point scale of earthquake intensity based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation. Effects range from those which are detectable only by seismicity recording instruments (I) to total destruction (XII). Most people will feel Intensity IV ground motion indoors and Intensity V outside. Intensity VII frightens most people, and Intensity IX causes alarm approaching panic. The scale was developed in 1902 by Giuseppi Mercalli for European conditions, adapted in 1931 by American seismologists Harry Wood and Frank Neumann for conditions in North America, and modified in 1958 by Dr. Charles F. Richter to accommodate modern structural design features.

Moment Magnitude (M_w). A logarithmic scale introduced by Hiroo Kanamori in 1977 that is used by modern seismologists to measure the total amount of energy released by an earthquake. For the purposes of describing this energy release (i.e., the "size" of an earthquake on a particular fault segment for which seismic-resistant construction must be designed) the moment magnitude (M_W) of the characteristic earthquake for that segment has replaced the concept of a maximum credible earthquake of a particular Richter magnitude. This has become necessary because the Richter scale "saturates" at the higher magnitudes; that is, the

Richter scale has difficulty differentiating among the sizes of earthquakes above M 7.5. To correct for this effect, the formula used for the M_W scale incorporates parameters associated with the rock types at the seismic source and the area of the fault surface involved in the earthquake. Thus, the moment magnitude is related to the length and width of the fault rupture. It reflects the amount of "work" (in the sense of classical physics) done by the earthquake. The relationship between Richter and moment magnitudes is not linear (i.e., moment magnitude is not a set percentage of Richter magnitude): the two values are derived using different formulae. The four well-know earthquakes listed below exemplify this relationship.

Location	*Date*	*Richter Magnitude*	*Moment Magnitude*
New Madrid MO	1812	8.7	8.1
San Francisco CA	1906	8.3	7.7
Anchorage AK	1964	8.4	9.2
Northridge CA	1994	6.4	6.7

Although some of the values shown on the M_W scale appear lower than those of the traditional Richter magnitudes, they convey more precise (and more useable) information to geologic and structural engineers.

Near-Source Factors. California Building Code Section 1629.4.2 and Tables 16-S and 16-T define the areas in which Seismic Zone 4 Near-Source Factors apply. The zones extend as far as 15 kilometers (9.3 miles) from the ground surface projection of a known active fault plane. The Near-Source Factors and, therefore, the standards for seismic-resistant design, increase as the distance from a construction site to the fault trace decreases. Seismic Source Type A is described by CBC Table 16-U as "Faults that are capable of producing large magnitude events and that have a high rate of seismic activity," and defined by a maximum moment magnitude of $M_W \geq 7.0$.

Nitrogen Dioxide (NO_2). A reddish brown gas that is a byproduct of the combustion process and is a key to the ozone production process.

Nitrogen Oxides (NOx). Chemical compounds containing nitrogen and oxygen; reacts with volatile organic compounds, in the presence of heat and sunlight to form ozone. It is also a major precursor to acid rain.

Noise Contour(s). Isolines (a line on a map or chart along which there is a constant value) representing noise, measured in decibels. See also Community Noise Equivalent Level.

Non-point Source. A pollutant source introduced from dispersed points and lacking a single, identifiable origin. Examples include automobile emissions or urban run-off.

NPDES. National Pollution Discharge Elimination System.

Open Space. Any parcel or area of land or water which is essentially unimproved and devoted to an open-space use as defined in the General Plan or designated on a local, regional, or state open-space plan as one of the four types of open space defined by state planning law.

Oxidant. The production of photochemical reactions in the atmosphere between reactive organic gases and oxides of nitrogen.

Ozone. A compound consisting of three oxygen atoms that is the primary constituent of smog. It is formed through chemical reactions in the atmosphere involving volatile organic compounds, nitrogen oxides, and sunlight. Ozone can initiate damage to the lungs as well as damage to trees, crops, and materials. There is a natural layer of ozone in the upper atmosphere, which shields the earth from harmful ultraviolet radiation.

Parcel. A lot, or contiguous group of lots, in single ownership or under single control, usually considered a unit for purposes of development.

Peak Hour. The busiest one-hour period for traffic during a 24-hour period. The PM peak hour is the busiest one-hour period of traffic during the evening commute period. The AM peak hour is the busiest one-hour period during the morning commute.

Pedestrian-oriented Development. Development designed with an emphasis on the street sidewalk and on pedestrian access to the building, rather than an auto access and parking areas.

Percent Slope. A common way of expressing the steepness of the slope of terrain, which is derived by dividing the change in elevation by the horizontal distance traversed. For example, an increase of 20 feet elevation over a 100-foot distance is a 20 percent slope.

Planning Area. The City and the land outside its boundaries that bear relation to its planning.

PM-10. The current standard for measuring the amount of solid or liquid matter suspended in the atmosphere ("particulate matter including dust"). Refers to the amount of particulate matter over 10 micrometers in diameter. The smaller PM-10 particles penetrate to the deeper portions of the lung, affecting sensitive population groups such as children and people with respiratory diseases.

Point Source. A source of pollutants which may be traced to a discrete point of emission.

Rare Species. A condition in which a species or subspecies, although not currently threatened with extinction, exists in such small numbers throughout its range that it may be endangered if the quality of its environment worsens.

Reactive Organic Gases (ROG). Classes of hydrocarbons (olefins, substituted aromatics, and aldehydes) that are likely to react with ozone and nitrogen dioxide in the atmosphere to form photochemical smog.

Recreation, Active. A type of recreation or activity that requires the use of organized play areas including, but not limited to, softball, baseball, football and soccer fields, tennis and basketball courts and various forms of children's play equipment.

Recreation, Passive. Type of recreation or activity that does not require the use of organized play areas.

Recycling. Any of a variety of processes whereby waste is separated for reuse or reprocessing into a useful form.

Richter Magnitude Scale. The Richter Magnitude Scale is a logarithmic scale developed during 1935 and 1936 by Dr. Charles F. Richter and Dr. Beno Gutenberg to measure earthquake magnitude (M) by the amount of energy released, as opposed to earthquake intensity as determined by local effects on people, structures, and earth materials (as in the Modified Mercalli Intensity Scale). Each whole number on the Richter scale represents a 10-fold increase in

amplitude of the waves recorded on a seismogram and about a 32-fold increase in the amount of energy released by the earthquake. Because the Richter scale tends to saturate above approximately M 7.5, it is being replaced in modern seismologic investigations by the moment magnitude (M_W) scale.

Ridgeline. A line connecting the highest points along a ridge and separating drainage basins or small-scale drainage systems from one another.

Right-of-Way. A continuous strip of land reserved for or actually occupied by a road, crosswalk, railroad, electric transmission lines, oil or gas pipeline, water line, sanitary storm sewer or other similar use.

Riparian. Pertaining to the bank of a natural course of water, whether seasonal or annual. Riparian habitat is defined by the surrounding vegetation or presence of known wildlife movement pathways; it borders or surrounds a waterway.

Scenic Highway/Scenic Route. A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment *of* natural and man-made scenic resources and access or direct views to areas or scenes *of* exceptional beauty or historic or cultural interest. The aesthetic values *of* scenic routes often are protected and enhanced by regulations governing the development *of* property or the placement *of* outdoor advertising. Until the mid-1980s, general plans in California were required to include a Scenic Highways element.

Sedimentation. Process by which material suspended in water is deposited in a body of water.

Seismic. Caused by or subject to earthquakes or earth vibrations.

Sensitive Receptors. Persons or land users that are most sensitive to negative effects of air pollutants. Persons who are sensitive receptors include children, the elderly, the acutely ill, and the chronically ill. The term "sensitive receptors" can also refer to the land use categories where these people live or spend a significant amount of time. Such areas include residences, schools, playgrounds, child-care centers, hospitals, retirement homes, and convalescent homes.

Significant and Unavoidable Impact. An impact that would result in a substantial adverse effect on the environment which would not be mitigable to a less-than-significant level. A project with such an impact could still proceed, provided the City prepare a Statement of Overriding Considerations, pursuant to Section 15093 of the CEQA Guidelines, explaining why the City would proceed with the project despite the occurrence of such an impact.

Significant Impact. CEQA (§ 21068) defines a significant impact as that which has "a substantial, or potentially substantial, adverse change in the environment." Mitigation measures are proposed, where feasible, to reduce the magnitude of significant impacts.

Solid Waste. General category that includes organic wastes, paper products, metals, glass, plastics, cloth, brick, rock, soil, leather, rubber, yard wastes, and wood. Organic wastes and paper products comprise about 75 percent of typical urban solid waste.

Stationary Source. A source of air pollution that is not mobile, such as a heating plant or an exhaust stack from a laboratory.

Subsidence. The gradual sinking of land as a result of natural or man-made causes.

Sulfur Dioxide (SO_2). A heavy, pungent, colorless air pollutant formed primarily by the combustion of fossil fuels. It is a respiratory irritant, especially for asthmatics and is the major precursor to the formation of acid rain.

Threatened Species, California. A species of animal or plant is endangered when its survival and reproduction in the wild are in immediate jeopardy form one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, disease, or other factors: or when although not presently threatened with extinction, the species is existing in such small numbers that it may become endangered if its environment worsens. A species of animal or plant shall be presumed to be rare or endangered as it is listed in: Sections 670.2 or 670.5, Title 14, California Code of Regulations; or Title 50, Code of Federal Regulations Sections 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.

Threatened Species, Federal. A species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Threshold of Significance. The established and identifiable quantitative, qualitative, or performance levels of environmental effect beyond which environmental impacts are considered to be significant. Thresholds of significance are based on current City policy and other normally accepted standards for environmental review.

Topography. Configuration of a surface, including its relief and the position of natural and man-made features.

Transportation Demand Management (TDM). Measures designed to reduce demand for automobile trips, typically focused on peak-periods.

Trip Generation. The number of vehicle trip ends associated with (i.e., produced by) a particular land use or traffic study site. A trip end is defined as a single vehicle movement. Roundtrips consist of two trip ends.

Vehicle Miles Traveled (VMT). A measure of both the volume and extent of motor vehicle operation; the total number of vehicle miles traveled within a specified geographical area (whether the entire country or a smaller area) over a given period of time.

Viewshed. The geographic area visible from a fixed point.

Volatile Organic Compounds (VOCs). A group of chemicals that react in the atmosphere with nitrogen oxides in the presence of heat and sunlight to form ozone: does not include methane and other compounds determined by EPA to have negligible photochemical reactivity. Examples of VOCs include gasoline fumes and oil-based paints.

Volume-to-Capacity Ratio (V/C). In reference to public services or transportation, ratio of peak hour use to capacity.

Wetlands. An area at least periodically wet or flooded; where the water table stands at or above the land surface (bogs and marshes). Also those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wildlife Corridors. A natural corridor, such as an undeveloped ravine, that is frequently used by wildlife to travel from one area to another.

Wildlife Refuge. An area maintained in a natural state for the preservation of both animal and plant life.

Williamson Act. Known formerly as the California Land Conservation Act of 1965, it was designed as an incentive to retain prime agricultural land and open space in agricultural use, thereby slowing its conversion to urban and suburban development. The program entails a ten-year contract between the City or County and an owner of land, whereby the land is taxed on the basis of its agricultural use rather than its market value. The land becomes subject to certain enforceable restrictions, and certain conditions must be met prior to approval of an agreement.

Zoning District. A specifically delineated area on a zoning map within which regulations and requirements uniformly govern the use, placement, spacing, and size of buildings, open spaces, and other facilities.

Zoning Ordinance. The City ordinance which divides Petaluma into districts and establishes regulations governing the use, placement, spacing, and size of buildings, open spaces, and other facilities. Combined with other development-related Ordinances (i.e. subdivision, hillside, etc.) these become the Development Code.